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Precision SHOOTING

Dealing exclusively with the topic of extreme rifle accuracy

A rather nice engraved Winchester highwall action, on a varmint rifle belonging to Kim Stemler, of Bridgeport, Michigan.

PRECISION SHOOTING

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Business Offices
5735 Sherwood Forest Drive Akron, Ohio 44319
Tel. 216-882-6877 (home)

Editor — David Brennan
Assistant Editor — John Gammuto
President — Myles Hollister
Vice-President — Dr. Richard Maretzo
Treasurer — Stella Buchtel
Corp. Clerk — Allie Euber

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PS STAFF

EDITOR
David Brennan
37 Burnham Street
East Hartford, Conn. 06108
(home) 203-289-8775

ASSISTANT EDITOR
ADVERTISING MANAGER
John Gammuto
27 South Oak Avenue
Westmont, Ill. 60559
(work) 312-269-8701
FAX 312-269-8318

SUBSCRIPTION MATTERS
Stella Buchtel
5735 Sherwood Forest Drive
Akron, Ohio 44319
216-882-6877

COLUMNISTS:

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Levitation and Gravity
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918-333-5276

Deputy Editor for Southwest
Robert Pease
P.O. Box 787
New Braunfels, Texas 78130
512-625-1342

Official Gunsmith on the San Andreas Fault
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A BIT OF NOSTALGIA

BILL VAN NOSTRAND, of Johnstown, New York, is seen here at the Pine Tree Rifle Club range (at Johnstown), in the year 1950. That rifle is Mike Walker's .219 Donaldson Wasp, and as you might have noticed, that's a Peabody Martini (big) action on that rifle. Bill was a real good shot in those early days, and apparently the rifle wasn't half bad either... it finished fifth in the match's grand aggregate.

(Photo courtesy of Mike Walker)

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STRAIGHT SHOOTERS

by

Joe Rychetnik

Back when I was growing up on the West Side of Chicago, my handgun prowess could be attributable to two factors. I never missed a Tom Mix program on radio (was a member of his Ralston Straight Shooters Club) and the lady who rented my Mom's spare bedroom, who carried a Colt .25 auto in her purse all the time. We lived in a neighborhood where most of the homeowner's names could be found in the Al Capone registry.

In fact, I made a small fortune in delivering groceries to many of them, as several tipped the bicycle boy from National Tea Company with silver dollars each Saturday. The store manager made sure I had a remunerative relationship with these "customers" as he told me one day, that none of them ever paid for their groceries. When I asked him why they did not pay, he said something about not wanting a pineapple tossed through his store window. He didn't have the Hawaiian fruit in mind.

The Lady in the spare bedroom often took my sister and I (my father had died in '29) in her car to the local Forest Preserve. We would sit in sunny glory in her rumble seat and she would drive with one hand on the wheel and the other holding upright a picnic basket. She loved us kids but never married as long as we knew her. People didn't think about having kids any other way then.

After the picnic she would wait till the others in the area had folded up and gone home. She would then have us collect all the beer bottles and pickle jars from the trash cans and take the mess down to the Des Plaines River where she would blaze away with her Colt, nary missing one bottle coming down that sluggish stream. Her splashiest hits thrilled us kids. None of this two hand hold either. Just a quick jerk to align the simple sight and, POW! another Heinz Gherkin jar was smithereens. She taught us that word and I used it often when writing school themes. She also started my pistol shooting career. A box of Western .25 autos was about $4.00.

On the West Side then, were many open fields we'd call "the prairies". When rodeos and carnivals would come to the metropolis they would set up their corrals, roping arena, and side shows in these fields, filling a whole prairie. The men always wore cowboy clothes and most carried shiny six shooters in gunslinger rigs. The older boys in our neighborhood could always find work helping move hay and setting up and were given free "ducats" for the show. The pistol twirling and fast draw event ending with the breaking of light bulbs tossed into the air always thrilled us. All of us wanted to be straight shooters after an exhibition like that. Some of the big Colt's would barely clear leather when the target would pulverize.

Seeking out the secrets of straight shooting didn't come easy. My high school shooting coach didn't put up with anything but the regulation positions with our Winchester 52's. At Boy Scout Camp we had more freedom and could empty out a box after the merit badge training

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PRODUCT WARNING

(Editor: a successful editor must be completely without scruples if he is to move ahead in things. With this guiding tenet in the back of our noggin we were recently reading the new issue of American Single Shot Rifle News... the delightful publication of ASSRA... (by the way, see their ad in this issue, which offers a complimentary copy, free for the asking)... when our eyes fell on this product warning notice. We liked it... and we thought that you would like it as well. Hey, what could I do... I was tempted... mortal flesh is weak... I succumbed... I ate of the forbidden fruit. Which is to say that I felt the letter too good for the likes of them, and I stole it. Shamelessly. Without remorse. Indeed with a sense of accomplishment. Darwin's theory, brought into modern times. The strong shall survive. You see something you like... if you're strong enough... take it. Hitler's theory, brought into modern times. I'm sorry about this, Rudi... but there was an empty spot on this page that I just had to fill, buddy. Tell me that I'm forgiven Rudi...)

Preparation H Lube

After reading the most recent ASSRA newsletter, I found myself compelled to report on a substance which has had so much publicity in recent months that it appears to be heralded as a bullet lube panacea. I feel obligated to report on my experiences using Preparation H as a bullet lubricant in my 32-40.

About six months ago, I began using this material to lube .322 diameter bullets from my Hocked mold. The groups were excellent. However, after a period of use, I noticed that increased sizing was required to keep pressures within tolerances. This became so serious, that I recently slugged my barrel and found, much to my surprise, that instead of .320, the groove diameter was now .311.

I strongly advise against the use of Preparation H, or any other suppository-type ointment as lubrication in metallic tubes.

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STRAIGHT SHOOTERS

Continued

session and gun safety program, at bottles, cans and informal painted targets if we "cleaned up the mess after." It made our day to blaze away offhand with the heavy target guns and Xpert ammo at things that would blow up into "smithereens". On our last day at camp the shooting merit badge coach set up a long plank across the target area with railroad "torpedoes" nailed at each position. He worked as a brakeman for the New York Central and got them "free". When our bullets hit the red varnished packets of powder and magnesium flash compound, it created an unearthly bang and everyone cheered. It was 100 yards, offhand, iron sights and we had five shots each.

The War interrupted an otherwise direct route to shooting stardom. We all saw Sgt. York shoot his way through the Old War's German Army and wanted to achieve such skills before we left basic training. In the Marines "the Range" followed three month's of boot camp. Another two weeks of spartan living in temporary barracks near the shooting ranges for all us jarheads to learn how to fire our weapons.

It was well established at this point in the Marine Corps training that none of us had a gun. If such was even whispered the unlucky one had to sleep with six to eight rifles. Everyone could recite the RIFLE poem.

The M-1 was phasing out the Springfield so we learned about each and made the easy transition to the "Eight Shooter". I made "sharpshooter" with the Garand even after the rear sight fell off on my final record shots. The range officer said he would average the score to be fair as there was no time to reshoot. I slicked in for sharpshooter. I could feel the desired "Scouts Sniper School" within my grasp but my professional background in photography jerked me out of the coral crunchers and into the world of aerial photography. Not much chance to practice and put to work my shooting skills when I was baby sitting a K-18 camera.

What bothered me about my range ordeal was that the officer then took the sightless rifle, asked for a clean target, and with one hand, holding the 9 pound piece like a pistol, managed to get eight shots in the black at 100 yards. He said something about the Old Corps and that shooting straight should become instinctive.

The writings of Jack O'Connor grabbed me up after the War. Him being able to clobber antelope and gazelle on the run fascinated me. How do you practice for that? My mother knew Frank Buck, the Bring Em Back Alive guy, who collected exotic animals for the Chicago Zoo. He told her he was an instinctive shooter, and never gave the target a thought. Just up and bang, I was told. She intimated that he really didn't want to talk about it as he remarked he was paid to "bring 'em back alive." I have a picture of him somewhere with a Model 99 .300 pointed up at a cat of some sort preparing to launch at him. I always suspected darkroom hanky panky.

Reloading was just becoming popular so three of us invested in a Herter's press and dies. GI brass had us knee deep in 4895 "hunting loads." To catch up with O'Connor, we tried jamming a cardboard bulls eye in an old tire and rolled it across the range. We often hit the tire somewhere.

The Korean War gave me another chance to put my shooting skills to work. After our reserve unit was called up I was asked to qualify with the M-1 carbine which was so much fun to shoot I didn't make Marksman this time. By then aerial photos were being done by little black boxes and I was relegated to an aviation ordnance outfit and often we would, en masse, be trucked off to fill the blank spaces in the Marine Line on the 38th Parallel. Back to the M-1 eight shooter with angry little fellows in padded pajamas shooting back. Hanging 500 lb bombs on Corsairs didn't seem so bad after five days in the filthy slot the Grunts called home.

Home again I came under the influence of Three Pump Upton, a "high power" shooter at the Portand Douglas Ridge Rifle Club. His real name was Claude but his fame came from putting three pumps into a Benjamin air pistol and pinging cats making doodoo on his front lawn. He got so he could shoot from any position either off the porch or from the BarcaLounger in his living room. He once did the unspeakable by bouncing a pellet off a cat's head and into a neighbor's windshield, having to placate both later that day.

He said practice practice practice was the answer to becoming a good shot. We would often sit in front of the TV and watch Dragnet with .45 ACPs in our hands, dry firing at Joe Friday's enemies. He was a good '06 shooter but seldom passed on anything about this skill to me, as he was afraid if everyone knew his secrets he would have too much competition making his NRA "Legs".

Later Three Pump added steam to the anti gun movement when he took his grandson shooting with a new Marlin Lever Action .22 with scope. They had a grand time at the range and came home to Mommy to demonstrate how well he did. Three Pump had placed a six pack of Bud on the kitchen sink counter and when the kid was demonstrating his aim, suggested he point at the six pack as it was a

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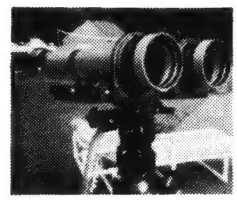

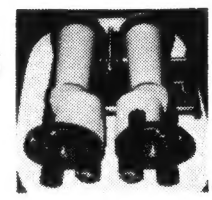

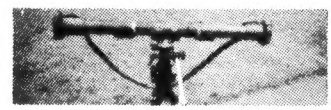

JERRY PHILLIPS

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fair twenty five steps away. Well, I guess you know the rest. The kid pulled the trigger. A waxy round had hung up in the tubular magazine and chose to release itself just as the kid worked the lever on the "empty" rifle. Three cans were exploded and hole chipped into the cast iron sink splashboard. The explosion left the whole kitchen dripping in beer. Three Pump, along with the smoking rifle were shoved out onto the back porch and told never to return. It was a mess. That room still has the aura of a tap room.

My next stop was Alaska, equipped with a new .35 Whelen rifle on an NRA Springfield action. Although the rifle later proved to be a superb game getter taking with one shot everything from Alces gigas, a six foot wingspan moose to bears both black and brown, to caribou and lesser species. Just about any 250 grain bullet worked like a magic pill.

But getting the rifle to perform was wrought with hazard. It arrived from the arsenal with a covering of Cosmoline, which concealed a cracked stock. I had seen a fine Springfield Sporter Whelen and wanted one just like it. The Cosby gunsmiths in Portland worked on it and had it ready just before our family moved to Alaska. It had an excellent B&L scope with 3 minute Lee Dot in the 4X tube. I had gotten it sighted in with some handloads and Herter roundnose softpoints but was not the first to take game with it.

My wife at the time was an outdoorsy woman who made friends with a hunting family in Cordova and was invited out on a "girls" hunt by the husband, who knew where some easy "freezer bulls" were hiding. Fine way to get someone interested in Alaska game, have them eat some. I had never tested the safety after a Timney trigger was installed locally. I never used a safety much, either chambering and shooting or keeping the bolt handle up or open for safety.

That husband insisted the two women he was escorting load their rifles at the landing and put their rifles on "safe". Fortunately Donna was in the lead of the trio as they entered the moose meadow and had her attention drawn to a fine two year old just 20 paces away. She placed the dot on the neck (we told her it would conserve the best meat) and moved the safety to fire when the Whelen did just that. The husband was astounded when both the first bull and one standing about ten feet away but unseen, fell down in the marsh. There were cheers all around but it wasn't until she got home that evening did she confess to me she never touched the trigger. I broke out in cold sweat at the thought of her being third in that line...

She became a very good shot under my coaching but not with the bolt action Whelen. She picked out a slide action Remington in '06 with Redfield large peep sight and gold front sight and proceeded to take a moose and a caribou or more every year for 12 years. She amazed me with her ability to throw the rifle up, find the right spot, and fire. She said shooting, except with a .22 was NOT fun, but painful, but our freezer needed her contribution so she went out every season as long as someone else would do the field butchering, packing, and home butchering. She wrapped meat and marked with a rubber stamp "Roast", Steak, "M-burger" and "DogMeat". We had an all ways hungry Great Dane then.

I put in four years almost to the day as a Trooper in the Alaska State Police. As deputy game warden and policeman I got in all the shooting I wanted. They even made me assistant range officer one year and I got proficient with the revolver teaching others the PPC. It wasn't until I was posted to Nome as the only enforcement officer for some huge area along the Chukchi Sea and Bering Sea Coast that I met another fellow who loved to shoot.

Bob Workman was the Nome State Jailer and had his days off to go out with me to the homemade range we set up or hunting when the season opened for waterfowl and birds. It was extremely embarrassing to me when we first went duck hunting on the Serpentine Flats north of Nome when he opened his zippered gun case and pulled out a Browning .22 autoloading rifle instead of the 12 gauge shotgun I had expected. He told me he was bringing a Browning so I never gave it a though, as I had a humpback in my case.

He wasn't phased at all and told me he never used a shotgun on any birds, that the .22 was much more sporting. I didn't mention the fact that it was against both state and federal law and I was an officer who could put him into his own jail when he drew his first bead.

About the time we were discussing the virtues of a .22 rifle against the 12 ga. a flock of ducks winged past us zooming out of a foggy patch of tules. His little .22 sounded like a machine gun as he dropped seven ducks as neat as can be, many quite near the beached boat we were using for a blind. He looked at me and asked if I wanted him to get a another limit and save getting the shotgun dirty.

My mouth was hanging open and I really didn't believe what I saw. But there

Continued on next page

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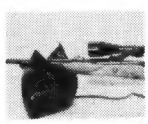

For the marksman who likes to get on the bull's eye quickly, with better comfort and better accuracy when shooting. Just squeeze the bulb while looking through your scope and bingo, you're on!

Dear Mr. Hammond,
Enclosed you will find a match report from the Crumlin Sportsmens Club of Ontario, Canada. This was the first match I shot with the new rifle you built for me. I had 54 break-in round through the barrel when I left for the competition. As you can see on the Grand Aggregate tally sheet, I did rather well.

- My 100 yard aggregate score was .2106". This is the low 100 yard score for the 1991 season at Crumlin.
- Crumlin is a tough range, conditions are generally difficult to get a handle on.
- The club sponsors three benchrest points matches per season. For the 11 years I have been shooting there, I have won the points championship three times (including 1991).

Thank you for building such a fine rifle. I am proud to have it.

Warm Regards,
Paul Burns
Dundas, Ontario

Crumlin Sportsmens Association
Charles Parkinson's Memorial Match
September 14, 1991

1 - 100 YD Light Varmint
2 - 200 YD Heavy Varmint

NAME	EVENT 1	EVENT 2	GR. AGG.
1 112 P. Burns	0.2106	0.2725	0.2416
2 107 R. Scarbrough	0.2112	0.3025	0.2569
3 408 O. Olsen	0.2194	0.3048	0.2621

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STRAIGHT SHOOTERS

Continued

were seven drilled ducks, dead and in the water near us. It all did happened. I commented on his shooting.

"Bob, where'd you get so good with the .22?"

"I always was this good. I could be better if I could practice more but sheeet, this was, Heh Heh, "Duck Soup."

I told him to put the .22 away in case we were visited by anyone and allow me to shoot my limit, as I came for the sport and enjoyed having the Hump Back go ca-boom ca boom as I filled the air with No. 5. He looked at me as a bit daft as I used half a box of high base to take my seven birds and many were bloody messes. We were home by noon.

Enroute he demonstrated his zipper technique for skinning ducks without a lot of feather mess. They all went into a plastic salad bag looking like they came out of a butcher shop.

Bob was a straight shooter of the old school. He confessed he learned to shoot when his Dad gave his big brother the new BB gun with the scope sight, and he got the passed down Red Ryder slide cocking BB gun with no front sight at all and a damaged rear Vee. He learned to track the flight of the golden BB's and could shoot marshmallows if someone was foolish enough to stand in front of him and toss them high.

Bob admitted he was lousy with a pistol as he felt the loss of a long arm to align mentally with a moving target. Sitting cans were a bore so I had to toss for him to show off, not only with the .22 but with any rifle or shotgun. He never used the sights, he admitted, so I took the B&L 4X off my Whelen when we tried it, and he did just fine at 25 yards or so, airborne.

Bob said he wanted to go to work for Remington being a demonstrator but he was not good enough, he admitted. I uncovered a pile of old supplies in the cellar of the state police post (it had once been the U.S. Marshal's office before statehood) and among the leg irons, strait jackets, and belly chains was a case of Winchester .351 SL ammunition and a .351 self loading rifle wrapped in oilcloth. I tried it out and with the iron sights, I was getting fast repeat hits at rolling cans on a sand bar near Nome. The NRA told me in a letter that the rifle and caliber was designed for law enforcement and prison guard duty as it shot a heavy bullet and had little range, ideal for stopping fleeing felons.

Bob's eyes bugged out when he saw the 5000 rounds of ammo waiting to be shot up. It wasn't on the state police inventory and the brass was useless for reloading so we could take out ten boxes and, as they say up North, "Have At It."

Bob had me throwing beer cans, and then baby food jars and then, smaller yet, old flashlight batteries, round stones from the sand bar and 2 ounce whiskey bottles we got from the trash dump. He worked his way down to targets in the air the size of gum balls and bottle caps. Sure, he missed one now and then but to see him swing and shoot was watching magic. We got down to less than 1000 rounds left in the case when the receiver cracked on the old Winchester. No repair available. It became a wall hanger in my office, a relic of the Marshal's reign. Perhaps broken when they sapped Wyatt Earp in '01.

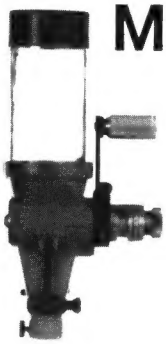
No matter how hard I'd try I could not learn to hit anything airborne by just sighting along the barrel and jerking the trigger. I decided I would stay with sights and take more time and leave the airborne targets to Workman.

As I accumulated a battery of hunting and sporting guns, I began to demand that they each be straight shooters to follow the advice of Col. Townsend Whelen who said that only accurate guns were interesting. Reloading, restocking, and even adding new sights and triggers made the difference and soon all of the collection would hold in an inch or better at 100 yards.

Returning to the South 48 a few years ago, I ran into the Precision Shooters of the bench rest world. There was no such thing in Alaska that I knew of and it took me by surprise that anyone would want to hunch over a table and fiddle around waiting for flags to stop fluttering and shoot their pipsqueak .22's. But I got bit and it's an old story of moving from the second hand .219 Donaldson Wasp on a Remington Hepburn action through the vast array of .22's spawned by the .222 and later the .223, always skirting bankruptcy or family breakup because one more gadget had to be added to make it all work better.

It was like sniffing cocaine until I ran into Uncle Zip. Zip holds the prestigious title of Supreme Senior Wolfchoker of the Barehanded Wolf Chokers and Pterodactyl Breeders Association, a motley group (some say 7000 names are on the membership list now) of hunters, fishers, and conservationists who believe in the blood sports as a way of life and have an addiction to all alcoholic beverages except Green Creme de Menthe. It's in the by laws, Green Creme de Menthe will never touch our lips. There is an involved handshake and a "cry" of recognition when one meets another BHWC'er. The first must buy or offer the Second a drink without delay. Anything but Green Creme de Menthe.

Uncle Zip, a Stanford Law Grad, runs the operation from his Redwood City home, which is filled with reports of pterodactyl sightings and wolf attacks and celebrates each year in March, on the day the buzzards return to Hinckley, Ohio. Zip is on a first name basis with both the COP (Chief of Police) and Chamber of Commerce lady in Hinckley, calling them weekly after Valentine's Day. The annual meetings are too elaborate to be described in detail here but much water goes over the dam, hunting and fishing



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produce is served, and there is a general air of well being and comraderie when the next dawn reveals most celebrants are still alive and snapping at table scraps.

Uncle Zip fastened on to me as I was a former Alaskan, a hunter, a shooter, and a striver for accuracy. He was suffering the old hunter's dilemma: to buy a new hunting rifle with all the bells and whistles or to go another season without.

"How many rifles you have now, Zip?" I asked.

"Got four 06's , a .30-30 over the fireplace, and a .22 trombone action Remington," he said with pride.

"Why four '06's," I asked?

"It'll kill anything on the continent and I don't plan to go anywhere else, now that I have quit workin' and done retired," he said.

"But why four rifles in the same caliber?" I pushed.

"Well, they can't improve on the cartridge but I keep hoping they make a better rifle than my first one, a Springfield Sporter with a Williams Guide sight and Redfield gold on the muzzle," he went on.

"What are the other three you have?" I asked curiously.

"I got me a pre '64 Winchester Model 70 with a Lyman Alaskan 4 power, a Weatherby that I had to fight 'em to not make a .300 — I wanted '06, and one of them Dakota Custom rifles with a Lee-oo pold (sic) Variable scopes that will shoot all day into a plum at a hundred yards," he told me.

"Seems like you're well equipped for anything, I don't understand the problem," I told him.

"I take 'em all with me when I go hunting. They have a padded place in the trailer so they don't shake loose, and they are all sighted in the with the same ammo, so there's no problem there, but it seems that I can't get away from the Springfield Sporter. It's a beat up old thing that I can grab up and shoot without even thinking about aiming. I've killed more deer, elk, and antelope with that thing than all the rest put together and I know they should be easier to make kills with but I favor the Springfield. I tend to keep my shots under 200 yards. Often I get but a second or two to make a shot to fill my tag and it seems the Springfield is right there and just right. It's a real straight shooter! he slapped his thigh and poured out the rest of the Miller Draft we were sipping.

"They say, beware of the man with one gun," I told him. "If the world became unglued and I had to survive I'd be happy as hell if I had the Springfield with me — a fellow would need a no fuss straight shooter and I got me one!"

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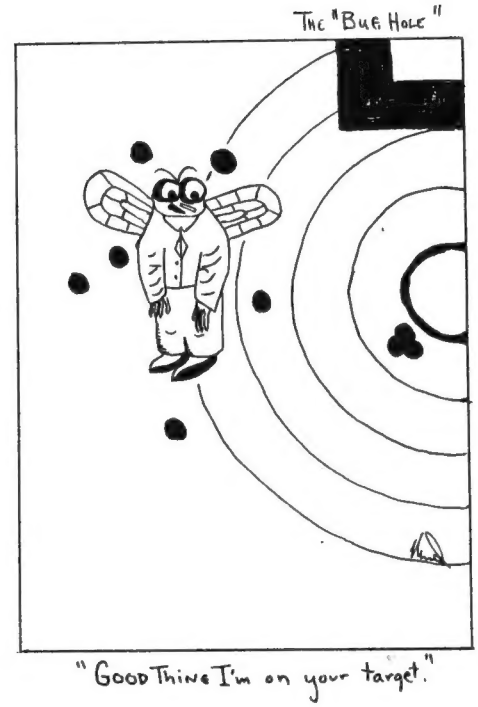

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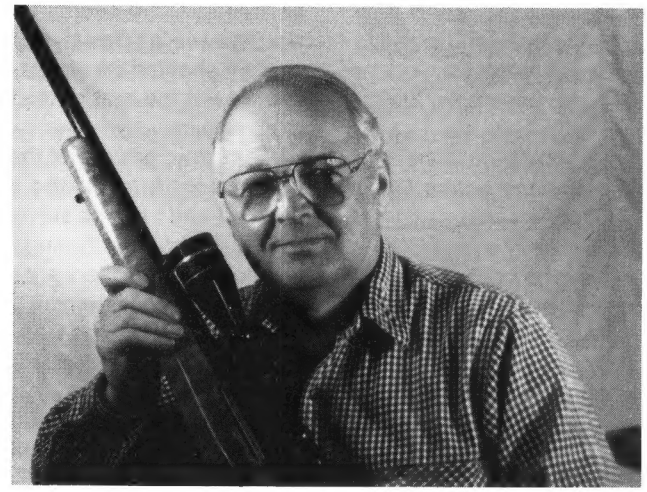
THE .257 ACKLEY IMPROVED

by

Bob Jourdan



Once upon a time, in the whole world of shooting, there were no .25 caliber rifles. It was dark and gloomy, and varmints were running loose all over the world. The black hole between the .22 and .26 calibers showed no light. In the U.S. there was nothing between the .22s and .32s. The little .22s had only backed the varmints off to 75 yards. Where there were some heavier .32s they backed up another 50 yards or so. And the very popular and common .44s had such rainbow trajectories that they were no help in varmint control.

F.J. Rabbeth just couldn't live with the idea of varmints being in full control of their destinies by staying only 150 yards away from the hunters and shooters who were after their hides. So... in 1884 he decided to add more punch and range to the number one varmint cartridge of the day, the .32-20, by simply putting a smaller lead bullet out front. The old .32-20 bullet was seated in the case mouth by reducing the diameter of the bullet base and a short section of the shank so it would slide inside the case mouth. The protruding portion of the bullet was the full .32 diameter to fit the barrel. When Mr. Rabbeth concocted his new bullet it was a straight .28 caliber but it still could not be fired fast enough to improve the range.

Step number two was called for. He necked the case down to quarter-inch and opted for an all new, unheard of caliber he called the .25. A new dawn began to show as soon as his original cartridge was commercialized as the .25-20 Single Shot. In only a brief few years dozens of wildcat and commercial .25s popped out ot the black hole, closing it forever.

By 1914 the .25s were not only the top long range varmint calibers, but were also becoming noted big game numbers. The .250-3000 set the world on its ear with the seemingly unrealistic high velocity of 3000 fps. Following World War I when all the returning warriors had been trained to use bolt action rifles instead of the lever actions of the frontier days, high velocity cartridges took over. New velocity records for over-the-counter rifles were set with the .270 Winchester at 3160 fps in 1925 and later the all-time velocity champ, the .220 Swift, in 1935 at 4110 fps.

Right in the middle of all these shooting advancements came the .257 Remington Roberts in 1934. It appeared earlier that the .257 would surely be a nice, if not great, new .25 caliber cartridge. It had done well enough as the wildcat .25 Roberts to be picked up by the legendary old rifle house of Griffin & Howe who produced hundreds of rifles chambered for the round, the development of which proves interesting.

It seems that after the .25 became established everyone tried their hand at wildcatting the caliber. First, all the old rimmed cases were shortened, blown out, necked down and just generally messed with in fitting them to the .25 caliber bullets. Then after armistice in 1918, all the experimenters started on the relatively new rimless cases. Ned Roberts was in the thick of it, having revised many versions of rimmed cases and moving on to the rimless. The most common case was the .30-06. Roberts had learned that case capacity was important when efficiency was being considered and the full length .30-06 was not any good when necked to .25. Simply too much capacity for the available powders of the day. He then started shortening it in the hunt for the correct volume and before long he had

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lopped off about a quarter-inch of brass and was getting excellent results. Others were busily doing similar things and among them were the likes of Townsend Whelen, Harvey Donaldson and A.O. Niedner. Whelen and Niedner had started Roberts on the idea of a shortened '06 case and later as Roberts got it down to about 2.25" long, Harvey Donaldson saw it as a standard 7x57mm case simply necked down. No case forming necessary. Roberts switched to it immediately and created the .25 Roberts. It was the 7x57mm case with a 15° shoulder and as word spread all the shooting fraternity gave it a try with glowing reports. Niedner's rifle company started producing the barrels that Griffin & Howe installed on all their custom .25 Roberts rifles.

In 1934 Remington Arms decided to pick up the .25 Roberts wildcat and make it legitimate. They changed the shoulder slope from the mild 15° of the Roberts to a steeper 20° and decided to use the bullet diameter rather than the bore diameter as its name. Thus was born the .257 Remington Roberts, commonly called the .257 Roberts today.

In the transition from the .25 Roberts wildcat to the commercial .257 Roberts, several curious decisions were made by the Remington management team. First, they decided to load it to a pressure level far below all the other new cartridges that were operating in the 52,000 c.u.p. range. By keeping the pressure around 45,000 c.u.p. the velocity potential found by the wildcatters was lost. Second, they decided to load the cartridge with a round nosed bullet of the poorest ballistic coefficient around. This effectively destroyed any thought of flat trajectory. But don't lose heart... When a good product starts going bad due to poor developmental decisions there seems to be no end to the down slide. The next great decision for the .257 was to put it in an action long enough for the .30-06 and then place a spacer block in the magazine to limit the overall cartridge length. This magazine length resulted in all factory ammo being loaded very short, with the bullet seated clear back into the powder reservoir of the case. Absolutely brilliant decisions.... And even in spite of all this, the cartridge sold rather well.

It did not take shooters long to discover the shortcomings of the new .257 Roberts. Naturally, it was compared to the much smaller cased .250-3000 that had been around for 20 years. The noticeable differences were that the .257 case was a quarter-inch longer and the

Continued on next page

This shows the standard .257 Roberts (L) and the blown-out .257 Ackley Improved (R). The enlarged shoulder gives the Ackley version about 12% more velocity with 6 grs. more capacity. Both cartridges can be fired in the Ackley chamber, but the .257 Ackley Improved cartridge certainly will not fit in the standard Roberts chamber!

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THE .257 ACKLEY IMPROVED

Continued

bullet points of the .257 were not as sharp. Even though the .257 was advertised as being about 100 fps faster and should therefore be the better long range cartridge, it did not perform that way. Experimenters quickly found the much smaller .250 was shooting flatter than the new .257 at 300 yards. Word was soon out that the new .257 Roberts by Remington had lost the shine of the parent .25 Roberts wildcat because of the corporate decisions mentioned earlier.

Any good, curious experimenter can spot a potentially good cartridge that isn't functioning properly in its factory dress. They are not tied to corporate ideas, advertising departments or legal staffs, so they can make improvements to a factory cartridge immediately. It was obvious that the larger .257 case should out perform the smaller .250 and the experimenters started removing the magazine spacers from their .257 rifles and loading the cartridge almost a quarter-inch longer and with pointed bullets of good ballistic coefficients. Velocities were advanced by 100-200 fps and trajectories flattened to give 50 yards more point-blank range. The .257 Roberts became the preferred .25 for varmints and big game use among handloaders across the country.

By 1940 a new player was moving onto the wildcatting and experimenting scene, P.O. Ackley. He was well schooled in the earlier works of Niedner, Newton, Whelen, Donaldson, Mann, Roberts and others, and was operating his gunsmithing shop in Oregon. He differed from most other gunsmiths in that he was a graduate of Syracuse University, with honors, and had the background for technical experiments in cartridge design and testing and was fully capable of writing and communicating his findings to others. And he was well aware of the shortcomings of the .257 Roberts. Thus it became one of his early Ackley Improved cartridges.

This lineup shows the three most popular .25 caliber cartridges along with their Ackley counterparts. The two on the left are the .250-3000 and the Ackley version; two in the middle are the .257 Roberts and the Ackley version; two on the right are the .25-06 and the Ackley version. The .257 Ackley Improved is the most popular of all the various improved cartridges. It is shown in most reloading manuals.

Early experimenters could easily "improve", or blow out, a case to an enlarged version when using the old rimmed cases. The rim thickness was the headspace guide and could be left alone while reaming out the chamber ahead of it to any larger shape. There was little risk involved. But with the rimless case headaches came in. The entire chamber had to be known. Headspace for rimless cases is the distance from the closed bolt face to some point on the chamber shoulder. Suddenly the random home grinding of reamers was out and cartridge experimenting turned to the more technically trained shooters and gunsmiths.

Ackley was soon recognized as the new leader in cartridge design and particularly with the improved rimless cases. He developed and published the information necessary for making improved cartridges in a safe manner. Much of his fame was derived from his new creation, the .257 Ackley Improved. In his writings he claimed the cartridge was relatively efficient and flexible and close to being the mythical "all around cartridge". The case is a bit over 6 grs. improvement over the standard .257. The shoulder angle is a sharp 40° and the shoulder diameter is blown out to .455", an increase of more than .025". And the real nice point is that the chamber will accept standard .257 Roberts ammo for fireforming to the Improved. No case forming dies required.

With the blown out case of the .257 Improved came greatly increased velocities. The little 60 gr. bullet could run a close race with the 48 gr. .220 Swift at something like 4100 fps from equal barrel lengths. On the heavy end of the scale the 125 gr. .257 bullet could be loaded to a little under 3100 fps which easily put it in a comparison race with the 130 gr. .270 Winchester. The recoil is considerably less than that of the .270, and accuracy is more easily attained. All-in-all, the velocity gain is about 12% above that of the standard .257 Roberts and is worth going after. Only the smaller .250 Ackley Improved shows a better velocity gain at around 15%.

Chamber reamers for the .257 Ackley Improved with the 40° shoulder are stock items from Dave Manson of Clymer Manufacturing Co. Inc., 1645 W. Hamlin Rd., Rochester Hills, MI 48309-3368, telephone (313) 853-5555. These are the reamers I use mostly, and they have been excellent. To convert a factory .257 Roberts to the .257 Ackley Improved requires some knowledge about chamber reaming. Since standard factory ammo is accepted in the Improved chamber it would appear that headspace would be the same. And if this were true, it would also appear that the chamber could be reamed out to Ackley specifications by simply clamping the rifle in a vise, remov-

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ing the bolt, inserting the reamer and twisting until the chamber walls were cut out and the new 40° shoulder was done. Check the headspace with the standard .257 Roberts gauge and start shooting. This is wrong because the assumption that the headspace is the same is wrong. So don't do it! A true improved chamber, as defined by Mr. Ackley, is one that safely accepts standard factory cartridges. Many wildcats carry the name "improved" in their names, but none will accept any factory cartridge without dire consequences....or worse. To make a proper improved chamber the new improved reamer must cut the chamber shorter by .002"-.004" than that of the factory chamber. Since you can't shorten a chamber without removing the barrel, the Ackley chamber can't be cut without barrel removal and cutting the barrel back by at least one thread. Then you cut the chamber slightly short so that the standard cartridge "GO" gauge won't quite go. When the bolt handle is allowed to fall while the gauge is in the chamber, it should not go fully down. Sure, you can apply a hamhand on the bolt handle and crush it shut, but by doing so you will crush the chamber corner at the shoulder-neck juncture. The whole idea behind this short chamber is to guarantee tight headspace for factory ammo and fireforming. Many gunshops do not understand this and therefore many improved chambers have excessive headspace, a well known no-no....

To make the accompanying loading chart I used a rifle with a thin, short 22" barrel. Most varminters use 26" barrels and most varmint cartridge velocities are derived from 26" tubes. Therefore, when considering the velocities on the chart you should add 100 fps to each to give you 26" barrel comparisons. And of course, none of the loads should be tried without starting 10% below the lowest load and slowly and carefully working back up while observing any pressure signs. Every shooter should understand that every barrel handles loads differently. Neither the writer nor Precision Shooting magazine recommend any loads reported here.

In making these loads up, I did not test to the point of primer or case destruction. Even the primer pockets were kept reasonably good through perhaps a dozen or more loadings, including the top loads shown. The quality of the test rifle was very poor and required considerable action rework to make it safe. For example, the bolt locking lugs had never been seated and almost the total firing load was being held by the Mauser safety lug. The barrel bore was non-concentric and the barrel was bent .025" end- to-end. Since it is almost, if not totally, impossible to cut a good chamber in such a barrel the rechambering effort resulted in the chamber being large at the rear. But even with these problems I was able to occasionally get some nice target groups. They were not consistant but did show that the .257 Ackley would be capable of excellent accuracy in a top line barrel and action.

By having a cartridge case for a .25 caliber with just under 60 grs. water capacity, the .257 Ackley is considerably more efficient than the larger .25-06. Almost the same velocities can be had with less powder and this equates to less barrel erosion, less recoil and generally better accuracy. Naturally, the larger .25-06 case will provide more powder capacity and more velocity can be had, particularly with the heavier bullets. But for a shooter who intends to work the gun long and hard the .257 Ackley would be the best choice. It should provide hundreds, if not thousands, more shots before burning the barrel and most average varminters do find this preferable. To a big game hunter it is not important because he will never wear out either barrel in the field.

With light-weight bullets of 60-75 grains, and including the new 78-79 gr. bullets being made by Bill Brawand and Jeff Fowler, both advertisers in PS, the velocities with the .257 Ackley will be about equal to those of the much larger .25-06. By the time the bullet weight gets up to around 90 grs., the .25-06 starts asserting itself with slightly better velocities. With the heavy 120-125 gr. bullets the big case will give about 150 fps more than can be had from the smaller .257 Ackley.

One of the mild surprises I continue to get from these small bore Ackley Improved cartridges is the performance of the relatively slow burning powder, H414. In the .257 Ackley it is about the best single powder you could use. With the little 60 gr. bullet 57 grs. of H414 gave 3940 fps from the short 22" barrel. The 75 gr. bullets gave 3686 fps with 55 grs. By adding 4" to the barrel length to make most varmint rifle comparisons proper, this would put the 60 gr. bullet at about 4050 fps and the 75 gr. at just under 3800 fps. This is simply big-time velocity from any size case. And for the big game hunters, there is nothing at all wrong with the 120 gr. .257 bullet at 2924 fps with 46 grs. of H414, which would be about 3025 fps from a 26" barrel. Even an elk would probably frown if hit by that load... My choice for deer and antelope would be the 100 gr. bullet, again loaded with H414 to the tune of 50 grs. for 3230 fps from the short barrel, or about 3330 from the longer version. This is the bullet velocity that I find worthwhile in all my various deer cartridges. It is still mild on the recoil end and reduces any lead on running game or holdover on far out game to something manageable. Then when the big game all goes to bed for the day, the load is excellent for noon-time prairie dogging....

There are some rifles made that will restrict the .257 Ackley cartridge length to that of the very short factory loaded .257 Roberts. Those that readily come to mind would include the few lever actions and pump actions offered in .257 Roberts that can be rechambered to the Ackley. I would try to avoid them and go for a regular length action that would allow the full length cartridge to fit in the magazine. This means the short actions ought to be avoided, even in bolt actions. Many old Mauser M98 actions are just the right length for the .257, since those known as Mexican, Argentine, Peruvian, and others will have magazines of about 3.2" which will allow loading the cartridge long to utilize all the case capacity and to get the bullet close to the lands in the barrel for perhaps better accuracy. While the common Remington M700 short action is easily available and makes about the best .250 Ackley you would want, it is too short for the .257 Ackley.

As an all around caliber, the .257 Ackley Improved does seem to be just as Mr. Ackley said: Very close to being the spitting image of the real thing.

Continued on next page

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.257 Ackley Improved 40°

Herter Model XK-3, 22" Barrel
By: Bob Jourdan

BULLET WEIGHT	STARTING TEST LOAD POWDER/CHG/VELOCITY/CASE				TESTED LOADS CHG/VELOCITY/CASE/TEMP				NOTES
60 gr.	H335				50	3914	R	62°	
	BLC-2	50	3686	R				62°	
	AA2520	45	3603	R				75°	
	IMR4895	47	3420	R					
	IMR4064	47	3378	R				63°	
	H414	55	3687	R	57	3940	R	75°	
75 gr.	AA2015	38	3194	R				80°	
	AA2520	46	3440	R	49	3631	R	52°	
	IMR4895	47	3412	R	50	3676	R	92°	
	IMR4064	47	3463	R	50	3619	R	55°	
	H414	53	3488	R	55	3686	R	75°	Very accurate.
	H450	56	3434	R	57	3522	R	84°	
	AA4350	54	3562	R				87°	Compressed. Accurate.
87 gr.	AA2520				46	3401	R	45°	Watch temp.
	IMR4895	45	3290	R	47	3398	R	92°	
	IMR4064	43	3222	R	46	3352	R	55°	
	H414	51	3306	R	52	3438	R	45°	Watch temp.
	H450	52	3186	R	55	3363	R	82°	
90 gr.	IMR4895	42	3004	R				72°	
	IMR4064	45	3225	R				75°	Accurate
	H414	51	3249	R	52	3377	R	75°	Accurate.
	AA4350	51	3294	R	52	3310	R	87°	Slightly compressed.
	H450	52	3141	R				62°	
100 gr.	IMR4895	43	3077	R	45	3179	R	92°	
	IMR4064	43	3104	R	45	3175	R	55°	Accurate.
	H414	49	3156	R	50	3230	R	75°	
	AA4350	47	3020	R	51	3179	R	52°	
	H450	50	3063	R	53	3217	R	92°	Accurate. .45", .35".
120 gr.	IMR4895	39	2776	R	41	2847	R	96°	
	IMR4064	38	2706	R	41	2871	R	55°	
	H414	44	2767	R	46	2924	R	75°	
	AA4350	45	2826	R	47	2875	R	82°	
	H450	47	2802	R	50	2953	R	92°	

Note: A gain of approximately 100 fps should be added for 26" barrels.

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REMINGTON/7 STW/#5 TAPER/ 10 TWIST/LENGTH 25	(1) $190 ea.
REMINGTON/7 STW/#4 TAPER/ 10 TWIST/MUZZLE BRAKE/LENGTH 25	(1) $190 ea.
REMINGTON/25-06/#4 TAPER/ 10 TWIST/LENGTH 24	(1) $190 ea.
REMINGTON/22-250/#6 TAPER/ 14 TWIST/LENGTH 24	(1) $190 ea.
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Q & A

Kent R. Miller
9881 Loralinda Drive
Cincinnati, Ohio 45251

March 5, 1992

Dave Brennan, Editor
Precision Shooting
37 Burnham Street
East Hartford, Connecticut 06108

Dear Dave,

I'm in the thinking (cheap) phase of designing a wildcat cartridge. This is new territory for me and naturally, there appears to be more questions than available answers. The phone bill is growing faster than the body of knowledge. Last week an idea struck me. Why not throw out the questions to the PS readership? Where else can you find such a large, concentrated group of experts? Besides, it's a good way to get the creative juices flowing. If you agree (I'll take sympathy too) and decide to publish this letter then, in turn, I will keep everyone posted on developments.

The cartridge envisioned is a efficient, high velocity, heavy bullet .22. The key word here is efficient. You can get anything moving fast with more powder, at the expense of barrel life. The intent is to get a less wind sensitive cartridge that would be good for varmints to 500 yards and targets beyond. The velocity goal is to achieve 3400-3500 fps at standard day (59°F/sea level) conditions using less than 40 grains of powder. The less powder the better. The primary bullet would be the 80 grain VLD type but, you should be able to use ordinary 60 grainers and still touch the lands with good neck engagement. Sound easy so far? Well, there are some constraints, primarily dealing with materail cost and labor.

The trick is to come up with a cartridge that you don't have to take out a second mortgage and a year's sabatical to develop or form and shoot. So, I dreamt on and came up with the following desireable qualities.

1. The parent case should be readily available.
2. Case forming should require few, if any, specialty dies.
3. Case capacity should result in 95+% loading density with the base of a 80 grain VLD bullet seated to the shoulder/neck junction. Both ball and stick powders would be used.
4. Reloading dies could be simple reworks of those already existing and commercially available.
5. Standard caliber actions would not require any.modifications.

A wildcat with these quailities would probably entice more people try it, which would provide a true test of its worth. Lots of shooters doing lots of shooting.

Some have suggested existing cartridges such as the 220 Swift, 22-250, 22BR, etc. but, I think they fall short with respect to loading density and/or neck length. They don't seem to be of optimum case shape or capacity for peak efficiency for this application either. No matter what case is used, you're probably looking at a 26-28" barrel with an 8" twist. That quick twist could be the limiting factor in obtaining high velocities within acceptable pressure limits. The two possibilities I've given the most thought to are a 22-250 Improved, shortened .3" with a longer neck and a 22BR Improved, both with 40° shoulders. There must be others.

Can anybody help a wanna be wildcatter? There's probably at least one soul out there who's already gone down this path. I'd love to hear from him and avoid re-inventing the wheel. Does anyone have some fancy internal ballistics software up to the task? If it appears that a new wildcat is warranted, I'll call it the .224 Longshot. That way, regardless of how it works out, it will have been named appropriately.

Thanks,

Kent

RICH KAYSER

Boy did you unload a 55 gallon drum of worms into four eager laps. I think you know what is coming from me, the Valkyrie (22-284) has been featured in a couple of recent issues of PS with some observations as well as the initial test results.

I think you need to separate the words "efficient" and "high velocity" when you discuss heavy bullet performance in a 22 caliber (or any other) rifle. The other segment of your letter that I question is the part about using various ball and stick powders. So far, to my knowledge, nobody has found a cartridge case that provides super accuracy with very many different powders. On to your five points of contention...

1. A readily available parent case. I would expect that we are talking 22-250 Improved as a minimum volume case. Then we go up through the 22-243, the excellent 224 Clarke, and finally stop at my Valkyrie. I have been in touch with Allen Allen and Dan Lilja RE their 8" twist Clarkes and 80 gr JLK bullet velocity/accuracy/downrange performance. They are up against the wall at 3400-3450 fps with a 51-52 gr load of IMR 7828 and 1/4"-3/8" groups at 100 yds. Not too shabby. I would expect a 22-243 to lag behind 100 fps at high but safe pressures. My Valkyrie hits 3600-3625 fps with a **full** case of the RVO-62 (20mm cannon) powder. I am going to see what RVO-57 (50BMG) will accomplish. I am getting groups in the .3-.35" range at 100 yds. I have also put those loads to the test on approximately 35 chucks so far this spring out to 500 yds with superb terminal performance.

2. Caseforming should be simple. Run the 243 or 6mm case through your FL sizer die and voila! the 22 version is ready to fireform. The 284 case needs to run through a 25 or 6mm 284 die before the 22 sizer. Neil Jones makes a form/necksizing die and bushings are $8.50 apiece I think. No problem.

3. I have 100-percent loading density with the RVO-ball powder with either the 70 or 80 gr JLK bullet. As I said earlier, I build specialty cartridge rifles, and take into account the intended job. This is an extended-range heavy bullet 22. Build it around one basic bullet/powder combination you figure out and take anything else as gravy on your meat and potatoes.

4. Anneal a set of 22-250 dies and run the reamer in. Better yet, cut the FL die with your resize reamer when you chamber the rifle and have it hardened.

5. Any of the three, 22-243, 224 Clarke or 223 Valkyrie will run through a short action magazine if desired. My next Valkyrie barrel will be a 9" twist, I think my velocities will support that spin rate.

In re-reading your letter, I think the velocities desired are unobtainable with sub-40 gr charges or low noise levels. Velocity is a direct result of volume and pressure. You get speed with a rifle just like a car engine. A big low-presssure design or a small high-pressure one. Lots of speed comes from a big high-pressure case. If a real efficient screamer is desired for 500 yard work, I would suggest a 17 caliber using Walt Berger's bullets. Todd Kindler is getting 3800-3900 fps with low noise and good efficient powder charges.

As an aside, give Jimmy Knox a call and ask him what sort of numbers he is getting with his 22BR with these heavy bullets? They are his designs, he should have an answer. I just do not see how to hit 3400+ fps in anything smaller than a 22-243. Lilja/Allen are just over that mark with the Clarke and 51-52 gr of IMP7828. I'm at 3600 fps with a maximum load of 62gr RVO-62. Theory is great, and I figured a lot and asked anybody I thought had any knowledge before having JGS cut the Valkyrie. I just have not seen any reliable data that supports the small-case idea. I would be very interested in hearing how Kent goes with a case choice for the .224 Longshot, and how he fares. Call me if you wish, and we'll talk a bit about cases.

(David: Thanks for including me in this exercise.)

Yours

Rich Kayser

Continued on next page

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Q & A
Continued

BOB JOURDAN

Dave,

The letter from Kent Miller concerning the development of a wildcat .224 cartridge was interesting, and your request to several of us for comment and/or answers gave us reason to contemplate a common idea that crosses the minds of many would-be cartridge designers. So here is my "studied and erudite" (your choice of words and/or name calling) reply.

Wildcatting can be fun and personally satisfying, but often goes off wrong, or at least in the same track as the originally invented wheel. Why develop a case that requires three to five forming dies, only to later discover that it has the same capacity as an existing factory case, or the same as an improved factory case? Using an improved case is right next to wildcatting without all the forming problems. To the average rifleman an improved cartridge is just as exotic or hairbrained as a pure wildcat, and will evoke just as much or more attention at the rifle range.

To start with, Kent's idea of staying around 40 grs. case capacity is correct for the .224 bullet. It is pretty well proven that larger capacities burn out barrels in a predictable fashion. But for certain uses, such as very heavy bullets where only slow burning powders will be used, the capacities can be somewhat enlarged without much barrel loss. When you start bumping up to near 60 grs. you should remember to buy your barrels by the dozen, in advance....

Kent mentioned the possibility of using the little BR case. While it will make an excellent .22BR varmint cartridge for ranges equal to the .223 or even a little more, it just isn't in the cards to blow a heavy 80 gr. bullet out of this case anywhere near 3500 fps. Not enough capacity. But the idea of improving the BR case with a 40° shoulder and perhaps other minor changes sounds interesting. It might be made to perform more than half way between the .223 and the .22-250 with 50-55 gr. bullets. There would not be much reason to use the long 80 gr. bullets unless the usual shooting range exceeds the quarter-mile mark. Beyond that the heavy bullet starts to perform its stuff, but it can't do so without more starting powder.

For the project the case to start with would be the .22-250. It already has the approximate capacity. Since this is for heavy bullets, 80 grs., slow burning powders will be best and will profitably use a little more capacity. Therefore, I would start off by simply using the established .22-250 Ackley Improved case. This is an exciting looking case that will lead all your shooting acquaintances to think of you as being too far out to stand close to at the shooting range.... They don't have to know it isn't a full-blown wildcat....

By blowing out the .22-250 to the Ackley Improved you, and anyone else who wants to try it, will find reamers and dies readily available. When you start backing the shoulder up .3" you leave these simple tools behind and wander off into expensive specialty items. Then, too, I think by the time you back the shoulder up you will find yourself back to the standard factory .22-250 capacity. A lost cause...? Another thought....why back the shoulder up? That would reduce the capacity more than just letting the bullet base enter the case body. No need to make the project difficult.

The considered 8" twist seems a bit quick when velocities of around 3500 fps are considered. That twist will handle 90 grs. or more at velocities well below 3000 fps. I don't have access to a computer program on this subject, but since 70-75 gr. bullets in .224 caliber are stabilized with 10" and even 12" twists, I would not want to speed it up to 8". A 10" twist would be the quickest I would want on an 80 gr. bullet at 3400-3500 fps. Maybe so, maybe no. Get someone with a computer to figure this one. I think Dan Lilja out in Montana can help here.

Now for a quick review of the five desireable qualities that Kent wants so as to prevent taking out the second mortgage and a year's sabatical to have his creation.

1. The parent case should be readily available. What could be better than the common garden varity .22-250?

2. Case forming should require few, if any, specialty dies. The .22- 250 Ackley Improved requires no forming, and dies are stocked by all die manufacturers.

3. Case capacity should result in 95+% loading density, etc. The .22-250 Ackley has a water capacity of about 48 grs. This gives room for around 42 grs. of slow burning powder. An 80 gr. bullet would reduce the capacity about the same as moving the shoulder back.

4. Reloading dies could be reworks, etc. Not necessary with the Ackley.

5. Standard actions would not require modifications. My short action Remington M700 uses the .250 Ackley, which is almost identical to the .22-250 Ackley except for the neck diameter, with no modification.

And concerning the possibility of enticing more people to try it (the proposed wildcat) an improved cartridge is much more compatible to the average shooter than is a pure wildcat because it can always be used with standard factory ammo with only a velocity loss of about 75 fps.

But I must admit that in spite of all the above, when a guy gets started experimenting with cartridges, and can afford it, and doesn't mind the gyrations of case forming, case losses, barrel replacements, etc., etc., then why not go for it...?

Have fun.

Bob Jourdan
385 Fenway Place
Bartlesville, OK 74006

Tony Boyer's 1991

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Photo: Stan Buchtel

BOYD MACE

Dear Dave

I was quite interested to read Kent Miller's letter regarding his desire to design a new wildcat 22 for use with the heavy JLK bullets.

Mr. Miller's goals all seem to be quite reasonable and obtainable except for one... it is going to take more than 40 grains of powder to reach his desired velocity of 3400-3500 fps with the 80 grain bullet. This is a really heavy bullet for this caliber and requires a large dose of slow burning powder to get it up to speed.

My first thought was the 224 Clark, which uses somewhere around 57-59 grains of the slow stuff to get the 80 grainers to 3500 fps. I have a friend shooting a Clark and this is about what he reports. Just to be sure I called Jimmy Knox at JLK Bullets and asked his opinion. He concurred, the only people he was aware of getting that much velocity were shooting Clarks. Just to be sure I ran the calculations through my ballistic computer program and came up with... the Clark.

My guess is that a 40 grain case will push the 80 grain bullet about 3000 fps. Mr. Miller's idea of a shortened, improved 22-250 would fall in there. Actually 3000 fps with this bullet isn't bad at all since it was designed for use at this or slightly slower velocities.

One of the necked down, improved 243 cases should push this bullet along about 3200 fps or so without excessive pressure using maybe 45 grains of powder. This would be my recommendation if the Clark seems too large. There are a number of good wildcats readily available using this design which would save the considerable cost of buying a new reamer and custom dies.

There are limits as to how fast you can push these bullets. They were designed for long range target work at modest velocities. When pushed too fast the long boattail will sometimes collapse. Jimmy Knox tells me this will occur with the 80 grain if pushed much over 3400 fps. These are very fine bullets and offer advantages with wind drift due to the high ballistic coefficient but velocities should be kept reasonable.

Pushing heavy bullets at high velocities requires slow powder and lots of it. You can't get around it unless you want to deal with extremely high pressures.

In my opinion there is nothing to be feared from large capacity cases when used with heavy bullets for the caliber. Barrel life can be quite good if the bore is not allowed to overheat and is cleaned religiously, along with reasonable pressures. Dirty bores, high temperatures and pressures are the things that wipe out barrels in a hurry.

My experience with high velocity 22 calibers has been that they are quite good out to 450-500 yards, but that's about the limit. Velocities drop off too fast and wind drift gets to be tricky. In addition the little bullets don't have enough grunt left to blow up reliably. Using the heavy bullets at slower velocities won't change that situation much.

While I have killed several prairie dogs at 650 yards and beyond with a high velocity 22 those shots were rare and done under good conditions. In addition I had a skilled spotter along to call my shots. I have since relegated my 22s to short and moderate range shooting and haul out the big 6MMs and 25 for the long range fun.

However, I am not one to discourage anyone who wants to tread into the unknown with a new wildcat. Mr. Miller just might come up with something interesting. I wish him luck and success.

Boyd Mace

DICK CUNDIFF

For better or worse, here are the opinions of the Desert Rat on the topic raised.

I suspect that most of the serious firearms enthusiasts in this fair land of ours (well, those who shoot the guns that they own, rather than merely collect them) have, at one time or another, considered creating their very own wildcat cartridge. It is nothing particularly shameful to admit... records show that it has happened in the best of families. The noble of mien and visage, or the penniless serf... few of us have not heard the siren song of the Lotus Eaters... perhaps it will be MY wildcat that will restore Atlantis to its former glory... to say nothing of making me both famous, and rich.

Continued on next page

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Q & A
Continued

Alas, in the real world, most of the wildcats brought into existance have been total non-events in shooting history. Few have occasioned anything but yawns from the cognoscente and the really knowledgeable. For every useful wildcat (the .219 Wasp and the .35 Whelen come to mind), there have been literally hundreds of Strange Creations that accomplished little, other than to enrich the forming die makers and the chambering reamer makers. One thing that the wildcatters have accomplished, I suppose, is to keep the factory case designers on their toes. The .17 caliber and the 6mm caliber are two that have benefitted greatly from the muddling about of wildcatters.

Most of the time the reason for a new wildcat is to try to exceed the velocity figures of a factory cartridge (or cartridges) in a given caliber. Frequently in this quest small matters such as high pressure, barrel erosion, case life, difficulty of case forming... all manage to be sort of nudged into the background. Many wildcat creators accept some or all of these failings in their wildcat creation... but who would have apoplexy on the loading room floor if asked to endure such problems in a factory cartridge.

A far nobler objective for the wildcatter is the pursuit of accuracy, rather than crass velocity-for-velocity's sake. The development of the 6PPC cartridge was a high point in wildcatting history. In recent years, "right here in these pages" there has been an enthusiastic amount of writing on ultra long range shooting, a slightly different phase of wildcatting that has brought about a type of wildcat cartridge designed solely for this activity, with little practical application in general, across-the-board usage.

My honest opinion is that velocity is secondary, and accuracy is primary... in wildcatting. If the shooter is blazing away at a prairie dog at 400 yards... I SUPPOSE that if you throw enough 4,000 feet per second bullets into his immediate vicinity, without hitting him... I SUPPOSE all that lead flying around him would cause a bit of a draught... and EVENTUALLY he could catch pneumonia, and die therefrom. Somehow it seems preferable to me to hit the prairie dog with your first shot. The chronograph is the only thing that will notice the difference between 4,000 feet per second and 3,600 feet per second; surely neither the shooter nor the shotee will notice. Consider the amount of varmints taken, over the years, by the lowly .22 Hornet!

Since the dawn of the Chinese hand cannon, I'm sure there has been a desire in most shooters minds to get their name in lights by designing his own Super-Dooper-Pooper of a wildcat just to be somebody. On the other hand, some serious considerations have gone into the designs of numerous wildcat cases over the years by some very knowledgeable individuals. Several of these "dreams" have become a reality by the adoption of the big factories of these wildcats. Quite a few of our up to date factory offerings are the result of some ingenious fellow fooling around in his garage, necking up and down and shortening existing factory brass, into a better balanced and more efficient case design.

In the 1920's and 30's, which I consider to be the "hey-day" years for the varmint hunting wildcatters, there was a need for more cartridges with a higher velocity and accuracy potential to replace some of the older black powder and obsolete smokeless powder cases. Most of these wildcat cases were .224 caliber and with the introduction of the .220 Swift in 1935, there didn't seem to be much need for some of the high velocity wildcats, although there was still some demand for the more accurate designs using less powder capacity. With the advent of the .222 Remington, in 1950, this kind of put the screws to the likes of the R-2 Lovells, the Lindahls, Kilbourns and even the Donaldson Wasp.

Amidst all of the factory offerings from the .17 Remington to the .416 Remington in the 1990's, it is difficult today to even consider a wildcat case, especially with the cost of tooling and components escalating every month and year. But as I have said before, "we do not all revolve around standard time".

Before we get into the premise of Mr. Kent Miller's letter of the designing of his wildcat, I will have to admit that I am not a member of the heavy bullet - long range syndrome cult. We all have our own opinions and are able to express them thanks to a bunch of guys with white wigs back in the 1700's, and I consider myself to be somewhat of a conservative when it comes to the subject of ultra-high velocity and extreme (over 500 yards) long range shooting; however we still practice the First Amendment around here.

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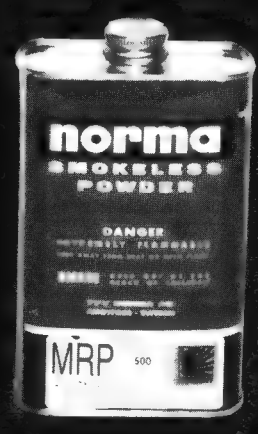

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NBRSA News

I also feel that there are too many novice and experienced shooters who read about tight-necks and special chamber throating and seem to think that these are some mysterious means of making their hunting and varmint rifles shoot better. In some ways this is true, but mostly because of superior custom gunsmithing practices over the factory offerings. I cannot recommend tight necks and land touching bullets in a live varmint rifle. These practices were designed for a benchrest gun where you are only shooting a very minimum amount of shots before cleaning and can control your reloading between matches for changes in temperature, etc.

There are some live varmint shooters that will shoot up to a hundred rounds before cleaning and the barrel gets so hot you could barbecue a prairie dog over it. With a tight neck, short throat and preloaded ammunition; you have a problem. A reamer .002-.004 smaller is fine for cleaning up necks with an outside turning tool but the so called "fitted neck" is absurd in any type of game hunting rifle.

As long as there are firearms using a brass case, primer, powder and bullet, every generation will produce a wildcatter and every time (almost) the new wildcatter thinks up what he considers to be a new design. All he has to do is a little research and he will usually find that it had already been done long before he arrived on the scene.

Let's take Mr. Miller's "dream" as an example. Thirty years ago or more, there was the .224 Clark, the .224 Barnes Q.T. and the .22-.243 Middlestead. In later years the Cheetahs and the .220 Jaybird from Kenny Jarrett. All of these cartridges are capable of achieving the design criteria of the .224 Longshot.

I also have a philosophy that if you need more bullet weight go to a larger caliber. Oh yes, we will always hear: "but they don't make good bullets in that caliber." Bull! Some of the finest bullets in history are being made in the good old U.S.A. in all calibers, and are perfectly adequate for most varmint hunting.

Why a heavy bullet .22? Because of the so called expansion ratio you can only utilize so much powder gas on a .224" base projectile. An 80 grain .224 bullet is almost 40% over the accepted maximum bullet weight in this caliber. You need a very fast 1-8" twist which adds to the torque factor. You have a much longer bearing surface adding to the already major fouling problem of most over-bore cases. You will also lose 500-600 f.p.s. velocity by using these heavy bullets, along with a rainbow trajectory. About the only thing you will realize is a high ballistic co-efficient; big deal! If the wind is going to blow, there isn't a hell-uv-a lot any law of physics can do about it.

Getting back to Mr. Miller's letter and the "key-word", efficient. I really do not think that there is an existing **brass** case that could be wildcatted to achieve the degree of efficiency that was dreamed up by Mr. Miller. In order to make any case "work" it takes expanding gas pressure and to make this gas it takes some sort of propellant. I do not think there is a propellant available that is capable of achieving the results that Mr. Miller is expecting. Of course the higher the pressure the more velocity is realized, but the weakest link between high pressure and the shooter is the cartridge case itself. Until someone comes up with some new exotic material to make a stronger case that will contain 80,000 P.S.I. for more than one shot, we will have to be content with the present day practice of doing things the old fashioned way.

I do not feel the answer to long range heavy bullet varmint hunting lies with the .224 bore size. Why do you think the 6mm P.P.C. is used more than the .22 P.P.C. in benchrest? Because of that extra .019" of area for the expanding gases to work on for velocity and at the same time utilizing a heavier bullet with minimal case capacity.

If recoil is a factor, the rifle in question will recoil the same degree regardless of caliber, if you use the same powder capacity and bullet weight.

In my own humble opinion an **87** grain 6mm VLD type bullet at 3700-3800 f.p.s. would be the "Nuts" for the long range varminter. This could be achieved without too much fuss and no special quick twists to screw things up. If a 12" twist could be used, better yet and there are several existing cases that can handle the propellant with just as much efficiency as we will find in 1992.

Well Mr. Miller, I hope I haven't burst your bubble and good luck with your endeavor. Like the saying goes, "If there is a will, there is a way", but some times it takes a little light on the subject to **see** the way!

Dick Cundiff
"The Desert Rat"

Continued on next page

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Kent R. Miller
9881 Loralinda Drive
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April 1, 1992 (This is really a serious letter)

Re: .224 Longshot

Dear Bob, Boyd, Dave and Rich:

Thank you! Precision Shooting is the only gun magazine I'm aware of that ordinary readers can send in questions and get such rapid, comprehensive and intelligent responses. They were just what the doctor ordered. You have really got me thinking and some of what each of you suggested will go into the .224 Longshot. The cartridge is taking the shape of a 22-250 Improved 40° with a long neck.

All of you commented that 40 grains of powder was not nearly enough to achieve 3400-3500 fps with an 80 grain bullet. Seems I was a bit too optimistic. Rather than compromise the velocity goal or significantly raise the powder required, the new bullets of choice will be 70 grainers. This is a decent balance of powder capacity to bullet weight, still overbore but, not excessively so. Slow powders and a long barrel should put 3500 fps within reach. The downrange results to 500 yards should be comparable to 80 grain bullets which need much more powder for similar velocities. The advantage of a less wind sensitive bullet would still be there with higher velocity (less flight time) offsetting the lower BC. 'Might even shoot a little flatter too. The final proof will be in the shooting.

The primary drawback with heavy (long) .224" bullets is that most over the counter rifles with .224" bores have 14" or 12" twists, which are not ideally suited for bullets over 60 grains. A 9" or 10" twist would be more appropriate. This creates the need to rebarrel as opposed to a simpler, less expensive rechambering job. I'll play it safe with a 9" twist and hope 80 grain bullets can be persuaded to stabilize also (pressure altitude permitting).

The 22-250 Improved 40° case is approximately the same capacity as a 220 Swift, without the rim and stretching problems (and it's alot sexier looking too). Forming an improved case is a simple matter of loading a factory round in an improved chamber (with a small amount of negative headspace) and pulling the trigger. That exempts you from speciality forming dies. I hope the die and reamer people will consider a longer neck an inexpensive alteration of their existing products.

Did he say, "a longer neck"? Yes, long necks are a preference of mine, especially for getting consistent neck tension and bullet to bore alignment with long bullets. Plus, the more bullet there is in a long neck, the more room there is for powder in the case without the need for a long freebore. I already own a set of reforming dies to take .308 Winchester to .250 Savage and it shouldn't be a big deal to keep going to 22-250, which leaves plenty of excess brass for additional neck length. No sense in letting perfectly good dies sit idle (I guess I'm just a glutton for punishment). Those shooters who don't care for the extra neck length/case capacity or case forming hassles can stick with the original Improved design.

Further experimentation would primarily be adjusting case capacity by moving the shoulder back a tenth or two. What I had originally thought of doing was shortening a 22-250 case with a cut off FL die, leaving the neck long, then, fireforming it in an improved chamber. You'd end up with sort of a 22BR on steroids. This may prove to be a tempting future step but, would require setting the barrel back and introduce unwanted case forming complexities. I'll probably try fooling around with the brass just to see if that can be done.

Chances are a long neck 22-250 Improved will be just the ticket with 70 grain bullets. I'll still be searching for the holy grail of efficiency via high loading density. Honestly though, if the velocity goal is achieved with powder space left over, I'll probably just keep adding powder because I like velocity about as much as efficiency. Besides, the Minister of Finance (my wife) would definitely frown on any cost overruns at that point anyway. Boyd, I recently read in your book about naming a wildcat after your wife but, somehow, the ".224 Marilyn Mae" probably wouldn't strike fear in the hearts of ground hogs and praire dogs. A question is, does a longer neck qualify this cartridge as a true wildcat?

It's getting close to the time for turning words into deeds but, I'm in no great rush. I'm in touch with a gunsmith and a die maker to assure everything fits right the first time and seeing if all this can be done without increasing the national debt. This comes from lessons learned on my .250 Ackley. I will keep you posted on significant events. Please don't hesitate a second to comment further. Your advice is highly sought after and appreciated.

Thanks again,

Kent

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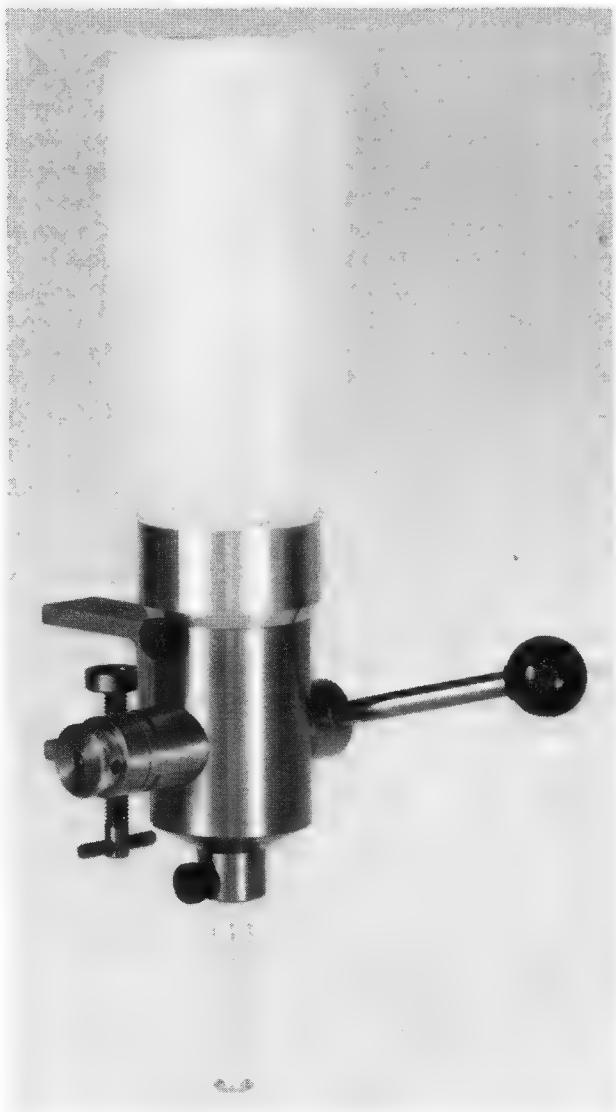

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TRIANGULATION AS A RANGE AID

John Gammuto

A while back Bill Creasy wrote and suggested that we do a piece on triangulation and its practical application in a range environment. Bill supplied us with the equations, we fancied them up a bit by adding some verbiage and computer graphics. If you ever have occasion to apply what you learn here, you can thank Bill for entertaining the thought.

Benchrest shooters know the value of being able to identify the origin of an errant shot on their target. Most crossfire situations are resolved when the guilty party realizes what he has done and owns up to his lack of concentration. Sometimes this is not the case and you have to rely on triangulation to identify the person, but it's rare. Most people are pretty honest about this sort of thing.

The prescribed penalty for crossfiring on another competitor's target is generally enough to put the offending party out of the running. I don't know anyone that has put a shot on someone else's target and walked away with a plaque or trophy. If it has happened, I'd like to know the circumstances that surrounded the incident. There's a job for someone with a story to tell.

For those of you that have forgotten everything you ever learned about Trigonometry, triangulation is the mathematical operation for finding a location by means of bearings from two fixed points a known distance apart. As the word triangulation implies, this has something to do with triangles. Similar triangles and their congruent angles are the keys to understanding the applied principle.

If you look at Exhibit 1, you will find a plat that contains all the information necessary to work through the appropriate equation. **A** represents the distance between the two benches in question. In this case let,s say that **A** = 5,, or 60". I believe you'll find it more convenient to convert all dimensions to inches at the beginning. It will be less confusing when you start working with the formula. **B**, the range yardage, or distance from the front of the bench to the near side of the target frame is 100 yards, or 3600". **C** represents the distance from the back of the target frame to the near side of the stationary backer. The rule books say that at this distance the stationary backer should be 36" behind the target. At 200 yards, it should be 72" behind the target frame. Therefore, **C** = 36.

To summarize, **A** = 60", **B** = 3600", **C** = 36", and **D** is the unknown we will be solving for using the following equations.

$$\frac{C}{B}=\frac{D}{A}$$

and

$$\frac{C\times A}{B}=D$$

The first equation sets the rules of the contest, if you prefer to think of it in those terms. The distance between the target frame and the stationary backer when divided by the range yardage (in inches), equals the unknown (**D**) divided by the distance of the centerline-to-centerline dimension of the two benches.

The second equation is the important one, and the one that will be supplying you with the missing information. You need to multiply the distance between the target frame and the stationary backer by the centerline-to-centerline distance between the benches, and divide that by the yardage (in inches) to arrive at D, the distance between your group and the wide shot on the stationary backer.

To simplify matters, when one competitor crossfires onto another target, similar triangles are formed (assuming the bullets go through approximately the same hole on the target in question). See Graphic 1.

$$\angle 1=\angle 2=90^\circ$$

and

$$\angle 3=\angle 4$$

$$=Congruent$$

The large and small triangles created by the paths of both competitors, bullets are similar to each other. When sides of similar triangles are in proportion, you can solve for **D**. All the club officials have to do is measure the distance between the two benches and work the formula in the following manner. We'll make use of the numbers we have been using right along.

$$\frac{36}{3600}=\frac{D}{60}$$

$$\frac{36\times 60}{3600}=0.6$$

If the stationary backer has a bullet hole in it a little over a half inch to the left of your group, chances are very good that your neighbor on the right is the guilty party. He probably will apologize later on, but I wouldn't count on him buying you a beer after the match.

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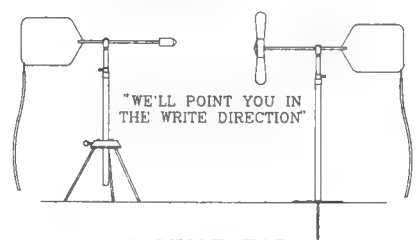

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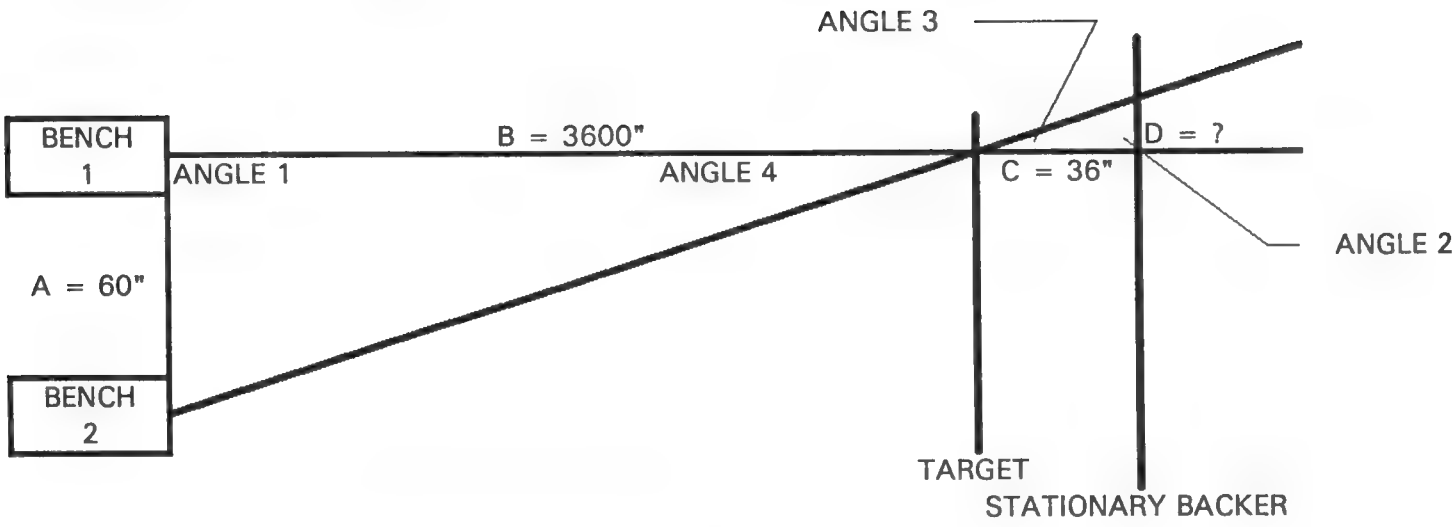

A = DISTANCE BETWEEN BENCHES
B = YARDAGE
C = TARGET TO STATIONARY BACKER
D = UNKNOWN

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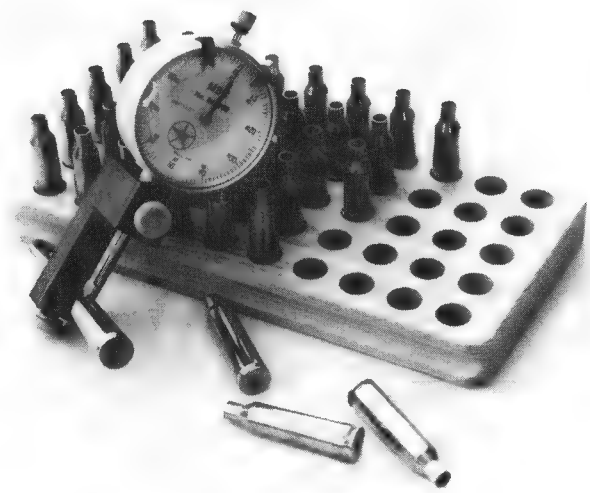

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6 PPC BARREL LIFE

by

Ben Peal

Dear Dave:

This is a follow-up to my May 1991 article on the .22 ppc. Please read it over, and if it sounds like bragging to you, please send it back to me. I don't pretend to be a Boyer or a Geraci; they shoot this way when it counts (in matches, often "big" matches). It is obvious that I was fortunate to have an exceptional barrel with which to work here.

I reported on my venture into the world of PPC in the May 1991 P.S. and mentioned that Seely had sent me a new barrel in 6ppc to replace the original 22ppc barrel. This is another 22" Hart and is set up for light varmint class. I prepared 20 each of 220 Russian and Sako USA cases. Neck wall thickness on the 220 Russian case is .0080 and the Sako USA case is turned to .0092. I used Berger bullets primarily and found the 62 grain to be best until the rifling began to wear. Bullets were seated in both lots of cases to just prevent the seated bullet's turning in the neck with finger pressure. Initial seating depth was set using Seely's seating gauge to barely scribe a line around the bullet when turned in the gauge.

I had no idea of what barrel life should be; only that I expected it to be better than the .22ppc. I have been told by some that 2,000 rounds is it. One individual had nearly 9,000 rounds through a barrel before it quit shooting. As it turned out, mine was much better than expected. I removed this barrel several times to examine it with a magnifier that allows a good look at the first 2 1/2" of the barrel. When accuracy became inconsistent at 2,300 rounds, I thought that was it. The bore didn't look bad, so I began playing around with seating depths of various bullets. At 3,300 rounds, a tiny bit of etching was beginning to show in the grooves and the land edges were rounding a bit. There were small longitudinal erosion cracks forming in the top surface of the lands, about 1/4" ahead of the throat. I seated a bullet to jam the lands and found four distinct marks; one about 1/2 the length of the four and one just barely distinguishable. Despite this, the rifle was shooting well, particularly with the 68 Bergers.

I went to the range, following the 3,300 round barrel inspection, and fired 100 rounds from the 100 yard line. Both .220 Russian and USA cases were used. When I first started using this barrel, I had used a seating depth, when working with 68 grain Berger bullets, that called for a measurement of 1.800" on my Wilson seater stem. At this point in time I was now working with Wilson seater stem measurements of 1.781" and 1.770". Conditions on this day (April 16, 1991) were excellent; 80° F, cloudy, 0-5 miles per hour breezes and no reverses to contend with. The day's results are shown in Table I below.

The 68 Berger at a seating depth of 1.770 W offered hope for further use of this barrel. I decided to try the 68 and 62 Bergers at 200 yards with the seating depth of 1.770" on the seater stem. Conditions on April 18, 1991 were again excellent and groups were much better than I generally get at 200 yards. The 68 grain bullet grouped better than the 62 grain, but I continued to use both until I retired the barrel.

Comparison of the 6ppc barrel after 4,884 rounds with the 22ppc barrel at 3,676 rounds showed obvious differences. On the 6ppc, the lands were rounded on the back and top edges, with some minor etching in the bore ahead of the throat. There are very short erosion cracks on the top bearing surface of the lands. Erosion and etching were very pronounced to the limit of my viewing area in the 22ppc and land top surfaces had long erosion cracks showing. The lands were feathered or tapered from the bore to the top edge for about 3/8" in length. The greatest wear in both barrels appeared to be to the bottom two lands, as the barrel is in position on the action; although this is less noticeable in the 6ppc. I tend to credit the cleaning rod with this. Even with a rod guide, it is apparently hard to keep the cleaning rod straight. The 6ppc was more accurate than the 22ppc, but I think part of that was due to my initial

TABLE I

27.0	H322	62 Berger	Russian Cases	1.781" W	
.302,	.369,	.255,	.237	=	.3032 Average
27.0	H322	62 Berger	Russian Cases	1.770" W	
.211,	.175,	.189,	.115	=	.1725 Average
27.0	H322	68 Berger	Sako USA Cases	1.781" W	
.242,	.160,	.189,	.233	=	.2060 Average
26.6	H322	68 Berger	Sako USA Cases	1.781" W	
.202,	.283,	.341,	.217	=	.2607 Average
26.6	H322	68 Berger	Sako USA Cases	1.770" W	
.143,	.196,	.079,	.259	=	.1692 Average

Average for 100 Rounds @ 3,400 Rounds through barrel = .2223

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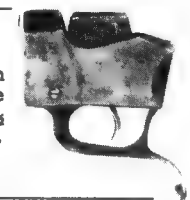

adaptation to the benchrest rifle and a 2 oz. trigger.

All loads for the 6ppc were assembled using Wilson dies, and case preparation was with Sinclair tools. The measure was Redding's 3BR and the scope was a B&L 36X. Powders were H322 (Scot & Aussie) GI322 and T32 and primers were Winchester, Remington 7 1/2, Remington 6 1/2 and Federal 205M. I finally graduated to two wind flags; one at 17 yards and one at 25 yards. I use an additional flag at 100 yards when shooting the 200 yard line.

After reading A. H. Angerman's article (in an old issue of P.S.) and noting the variance in primer weight and flash, I was curious to see if there was a significant difference in velocity, velocity spread or accuracy among small rifle primers. Target Number One was fired to check accuracy performance differences between Winchester, Remington 6 1/2 and 7 1/2 primers. I have made similar comparisons, including the Federal 205M and, to a limited degree, CCI. I realize the quantity of rounds fired is insufficient for statiscal conclusions, but these kinds of comparisons and the practice of alternating primers on different range days leads me to believe there are no poor primers on the market.

Table II shows the velocities and maximum velocity spreads using Winchester, Remington 7 1/2 and Federal 205M primers. On the days I picked for this, February 27th and 28th, 1991, conditions were terrible. Winds were blowing from one to three o'clock at 10-20 mph. Skies were overcast and it was cold (50°F and 20 mph north-east winds are cold to us Southern boys). I set the Pro-Tac at 10' with the intention of firing 20 rounds of each load for comparisons, but cut it short because of the weather.

Continued on next page

TABLE II

27.0 H322 (Australian) 68 Berger Sako USA Cases

Rounds Fired	Primer	Avg. FPS	FPS Spread	Avg. Group
10	Win.	3167	57	.285
10	Rem. 7½	3206	67	.371
10	F205M	3183	60	.291

27.0 H322 (Scotland) 68 Berger Sako USA Cases

Rounds Fired	Primer	Avg. FPS	FPS Spread	Avg. Group
10	Win.	3289	43	.573
10	Rem. 7½	3294	53	.191
10	F205M	3269	28	.288

27.0 H322 (Australian) 68 Berger Russian Cases

Rounds Fired	Primer	Avg. FPS	FPS Spread	Avg. Group
10	Win.	3104	13	.176
10	Rem. 7½	3144	57	.257
10	F205M	3112	66	.230

28.0 H322 (Australian) 68 Berger Russian Cases

Rounds Fired	Primer	Avg. FPS	FPS Spread	Avg. Group
15	Win.	3212	13	.227
15	Rem. 7½	3234	40	.220
15	F205M	3220	24	.327

27.5 H322 (Australian) 68 Berger Sako USA Cases

Rounds Fired	Primer	Avg. FPS	FPS Spread	Avg. Group
20	Win.	3179	62	.400
20	Rem. 7½	3221	41	.371
20	F205M	3219	63	.276

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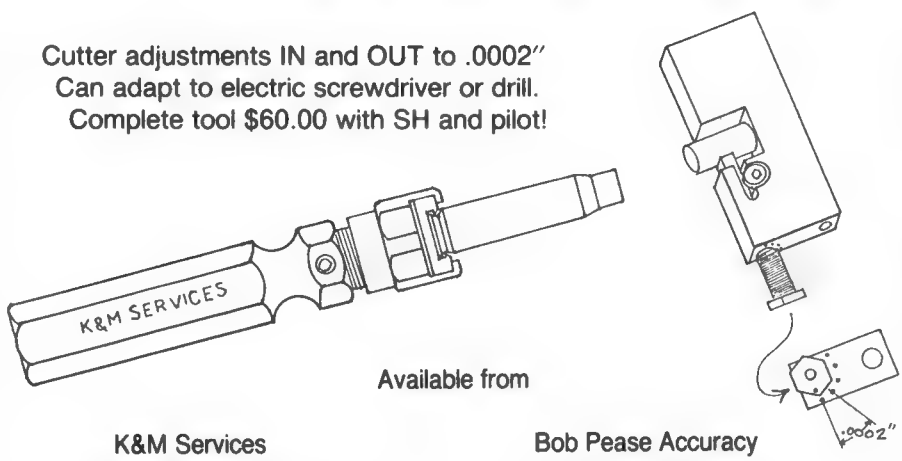

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6 PPC BARREL LIFE

Continued

Doe Wynn and I often discuss the effect of different components and techniques. One thing we were curious about was bullet accuracy after the full length resizing of cases or bumping the shoulder back. I routinely bump the shoulder back on Sako USA cases .0015" with a Redding full length size die after three or four firings. I bumped the shoulder back on the 20 USA cases and fired a series of groups at 200 yards. Each case was loaded and fired five times. Powder was 26.6 grains of H322 (Scotland); Remington 7 1/2 primers and a seater stem measurement of 1.770". Conditions were fine at the beginning, 84°F, a 0-5 mph southeast breeze and overcast skies. After the fourth firing sequence, winds picked up to about 10mph, began switching and the sun came out with heavy mirage. These groups, as well as groups fired at 100 yards, do not indicate any significant difference due to the minimum change in case dimension from using the Redding die. Results are shown in Table III.

The 200 yard targets are my own concoction on photocopy paper, but the 9 and 10 rings are dimensionally correct. Targets number two and three are from the first and second firing of these cases after bumping the shoulder back.

This is getting a bit long, so I'll try to wrap it up. I was surprised at an increase in useful barrel life of almost 25% for the 7ppc over the 22ppc. What was even more surprising to me was the way this 6ppc barrel continued to shoot with the 68 grain Berger bullets after I found the uneven lands wear at 3,300 rounds. The rifle continued to shoot well for another 1,255 rounds. The final good day with this barrel was on June 11, 1991 when I fired 60 rounds in a primer comparison (Target No. 1), bringing the total through the barrel as of this day to 4,555 rounds. I checked the log book for averages on the 68 grain and 62 grain Bergers during the period of 3,300 rounds to 4,555 rounds. During this 1,255 round period, my log books indicate a total of 86 groups (420 rounds) were fired with the 68 Berger for an average group size of .2273. There were 78 groups fired with the 62 Berger for an average group size of .2871. The remaining 465 rounds fired during this period were from the 200 yard line or with other brands of bullets. I continued using this barrel until 4,884 rounds. The final agg that retired the barrel was .3179.

I have certainly been pleased with my first 6ppc barrel. Back in 1989, when first considering the ppc, I called Don Geraci who told me, "Believe anything they tell you about the ppc... it's that good." I know what he meant. I now have my second 6ppc barrel, another Hart using Seely's old reamer. I would like to try a barrel of some other manufacture, but it sure is hard to change when things are going so well.

Good Shooting!

Ben Peal
4910 Colombia Drive
Pasadena, TX 77505
(713) 998-8580

TABLE III

First Firing after sizing, 68 Berger	-	.466	.560	.362	.449	= .2296
Second Firing after sizing, 69 Berger	-	.364	.256	.461	.363	= .2180
Third Firing after sizing, 62 Berger	-	.807	.912	.413	.593	= .3406
Fourth Firing after sizing, 68 Berger	-	.366	.442	.408	.299	= .1894
Fifth Firing after sizing, 68 Berger	-	.416	.726	.932	.871	= .3681

ON THE RUGER NO. 1

In the continuing discussion of Ruger No. 1 Single Shot Rifle forearm bedding... last year a nationally-known gunsmith glass bedded a free-floating Alex Henry forearm to the hanger and with proper rear contact to the hanger and receiver front of one in .300 Win. mag. caliber. The rifle was taken north and kept in a cabin in Washington state until the first week of March (1992). I recently returned to that area and retrieved it for an acquaintance. Upon cursory examination, I saw that the forearm had slightly warped away from the barrel, and **no rear contact** remained to the receiver or the hanger — the only solid contact was at the **bottom front** of the hanger. In fact, when striking the bottom rear of the wood with my hand, it hummed in a deep, resonant tone. The forearm's rear section has now been glassed for appropriate contact, but just how long it will remain so...?...

No. 1 rifles have decided trouble in maintaining a month-to-month zero, especially due to unstable forearm wood. This last example further adds to my experiences and reinforcement of my conviction that No. 1 forearms MUST be free floated for consistencies in zeroing and accuracy, **and the fit regularly monitored.**

Karl Bosselmann
Tombstone, AZ

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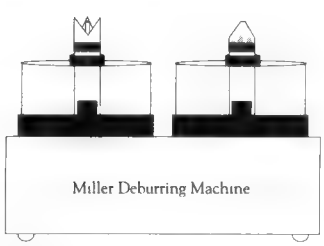

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TEMPERATURE DIFFERENCES CAN MAKE A LOT OF CHANGES IN ACCURACY

by Geza Nagy

I received a new barrel from Pac-Nor Barreling a little over a year ago, back in December 1990. Pac-Nor is a P. S. advertiser, located in Brookings, Oregon.

I had previously tested another 6ppc barrel from this company. That was a lighter weight barrel; the results of that test were published earlier in Precision Shooting.

I talked to Chris Dichter, the honcho at Pac-Nor by phone, and he offered to send another barrel of benchrest configuration. I requested a 6mm gain twist barrel. I know that there is nothing new about gain twist, but 1 felt that I would like to experiment with it.

When I was helping Dr. Palmisano test guns for the U. S. Shooting teams, there was a noticeable difference in pressure in 2 guns with different twist rates. They were both .240 Weatherby Magnum. One had a 7.3" twist and the other had an 8.5" twist. The intent was to see which would stabilize the 105 grain V.L.D. bullet the best for 300 meter shooting. I found the gun with 7.3" twist developed pressure signs earlier in load development. There didn't seem to be any problem of bullet stability with either twist. The 8.5" twist could shoot higher velocities with less pressure.

In my mind, I had the idea that if a bullet started out in a slower twist with less pressure and gained to a faster twist as it increased in velocity, leaving the muzzle at the predetermined rate of twist, this might be a good thing.

This is probably a difficult thing to do accurately. Chris agreed to try it. I received the barrel around January 1991. He sent me a copy of the barrel scan done by Photronics Systems Engineering Company.

The barrel was a 6mm, 6 groove, button rifled with an experimental button. It was made of 416 steel with full heavy varmint taper.

The design was for a 14" twist. The scan showed 14.651" average twist. This was a little slower than I had expected. However, nothing was wasted, as I got both good and bad results from that barrel, and in the end I believe that I learned more from experimenting with it than if I had gotten just what I wanted.

Chris has been having a lot of barrel scans done by Photronics to monitor his manufacturing process. He experimented with different types of buttons, different lubes, and each time he sends the barrel to get a scan done to see the results of it. He has come a long way since I got the first barrel two years ago.

I had Michael Toth, of M.D.T. Precision, chamber this barrel. He used a J.G.S. .263 neck diameter 6ppc reamer. That is the same reamer as was used on my other barrels that he chambered for me.

First Test - Target A

I lost track of the exact date. It was either the end of January or early February 1991. The temperature was somewhere between 40° and 50°. It was not too cold for that time of the year.

I started out with a known load for other barrels, using 68 grain flat base bullets. Target A will show the results of that test. They would not stabilize and half of them keyholed. I tried several different brands of 68 to 70 grain boat tails and flat base with the same results. Target A was typical of all of them. I didn't have any lighter bullets with me to try.

I started to pack up my equipment to go home. About that time, my brother showed up to be my guest at the range.

He had a box of loaded rounds that he intended to shoot off. The label on the box showed that he loaded that box eight years ago on December 1982. It showed 51.5 clicks on the Culver of H322 with 63.5 grain boat tail bullets.

He offered to let me shoot them in my gun. They chambered very hard. My chamber was smaller than his, but at least I was able to shoot them. They stabilized fine with no evidence of keyholing. The accuracy wasn't all that great, however.

I had one target with the first 3 shots in one hole with Joe's load. I loaded one of my cases with a 68 grain flat base and another with a 70 grain boat tail. I shot these two on the same target. Both were fliers again about 3 inches from the group. One went high and the other low, with both half keyholing. I added two more shots with Joe's load and they went back into the group.

The 63.5 grain bullets would stabilize in that temperature, but anything higher would not.

Second Test Date July 17, 1991 - Target B

This was not the kind of day to test anything. The temperature was 95° to 100°, with bright sunshine and very strong head winds. I had been running low on my good powder lots. I brought along a couple of new powder lots and the chronograph. I decided to spend some time chronographing these powder lots for future load development.

My brother Joe came down again. I chronographed some of his loads too. We spent a good part of the day doing this.

Later in the day I put on the Pac-Nor gain twist barrel. I had some 63 grain

Continued on page 32

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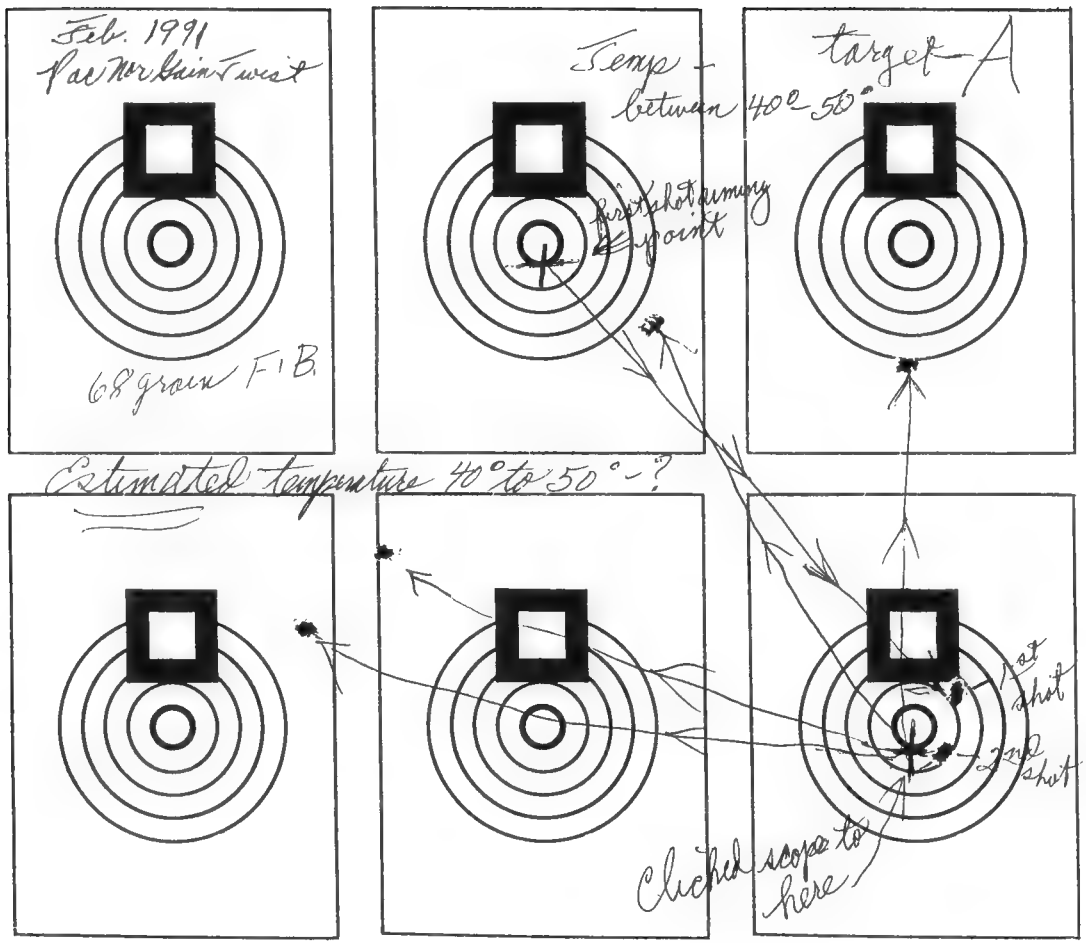
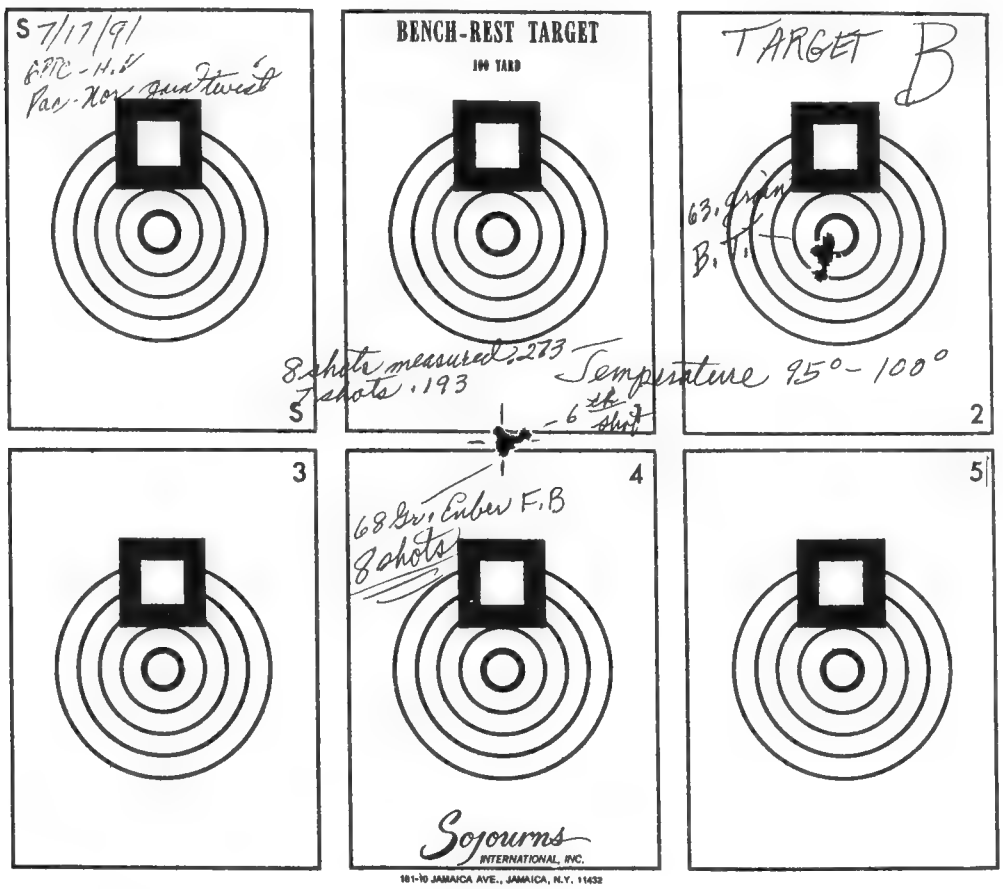

Feb. 1991
Pac Nor Gain Twist
68 grain F.B.
Temp - between 40° - 50°
target A
first shot aiming point
Estimated temperature 40° to 50° - ?
1st shot
2nd shot
Clicked scope to here


S 7/17/91
6PPC - H.V.
Pac-Nor gain twist
BENCH-REST TARGET
100 YARD
TARGET B
63. grain
B. T.
8 shots measured .273
7 shots .193
Temperature 95° - 100°
6 th shot
5
2
3
4
68 Gr. Euber F.B.
8 shots
5
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TEMPERATURE DIFFERENCES

Continued

boat tail bullets with me this time. The chronograph was still set up. I loaded one round with a 50.0 click Culver setting of H322 Lot #82090; one of the new lots. I bore sighted the gun. That shot, with the 63 grain B.T., chronographed at 3244 F.P.S. I clicked the scope to get the point of impact to the center of the target. That first shot was an unusually high velocity for the 50.0 Culver setting. It may have been partly due to the high temperature.

I cut the measure back 2 clicks to a 49.0 setting. The next 4 shots went into a .123 hole with an average 3151 F.P.S. This powder lot is a potent one.

I put out a clean target. I shot 3 more groups with that load. None were that great with conditions the way they were.

I decided to shoot the same load that went wild on the first outing with this barrel. I took down the chronograph. It was a little distracting. It blocked my view of some of the wind flags.

I put out a clean new target with six targets on one page. I drew a small round dot with vertical and horizontal lines running through it. This centralized aiming point would allow the wild shots to show up somewhere on the paper. The target face was blurry in the scope, but I could see the aiming point.

I had 8 loaded rounds with the good load left over from the morning session. That was the last of that power lot that I had with me. The load was 51.5 clicks on the Culver of H322 Lot #42288 with 68 grain Euber F.B. It was the same load that keyholed in the first test. I fired one shot and couldn't find any new holes on the target. I assumed it may have gone into one of the black aiming squares on the target. This kept up until the sixth shot, when I saw a hole next to the dot that I drew on the target. I finished the last two shots and couldn't see any new holes except the one.

I loaded enough for one more group with the 63 grain B.T. and Lot #82090 powder. I shot this on the upper right corner target on Target B.

I went down to pick up the target and was astonished to see that, indeed, the shots were going exactly into the aiming dot that I put in the center of the page. I had expected them to keyhole all over the target. The eight shot group measured .282 with seven out of the eight measuring .193.

There were no wild shots or keyholing as on the first outing. It helped when I took the chronograph down to see the wind flags. It is obvious that the temperature difference of 95°+ at this outing was the deciding factor of bullet stability of those 68 grain bullets. The first time it was under 50°.

Third Test Date August 9, 1991 - Target C

I repeated the procedure as in Test #2 with aiming dot and lines drawn through it in the center of the target page. There was a light drizzle of rain with light head winds blowing in. The fouler and 2 sighters went into the same hole just below the aiming dot.

I moved up to the top left target and shot a group of 5 shots on it that would be just under .250 group. I cleaned the gun and reloaded the cases. Just as I started the second group it got suddenly cooler and the rain came down hard. As I was shooting the group, the wind got stronger, blowing the rain over the complete bench and on me. The first shot was round. The fifth shot went over onto the first target. That hole was oval in shape.

I regreted not having my thermometer with me. I can only guess that the temperature was originally near 70° and suddenly dropped to the low 60's or more. I also believe that the rain blowing into the

Continued on page 34

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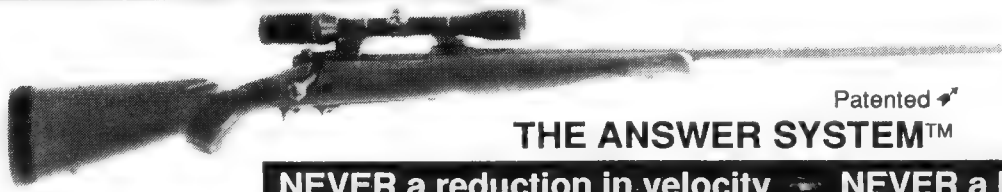

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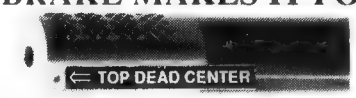

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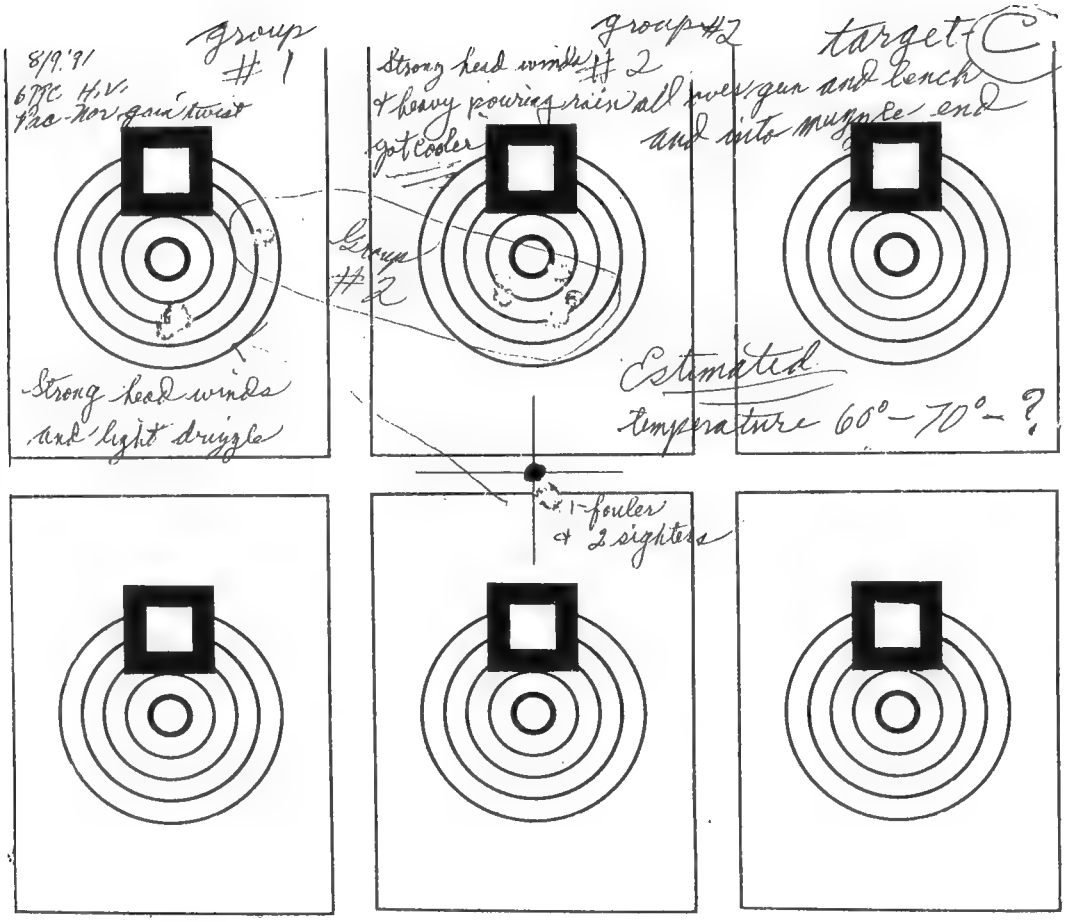
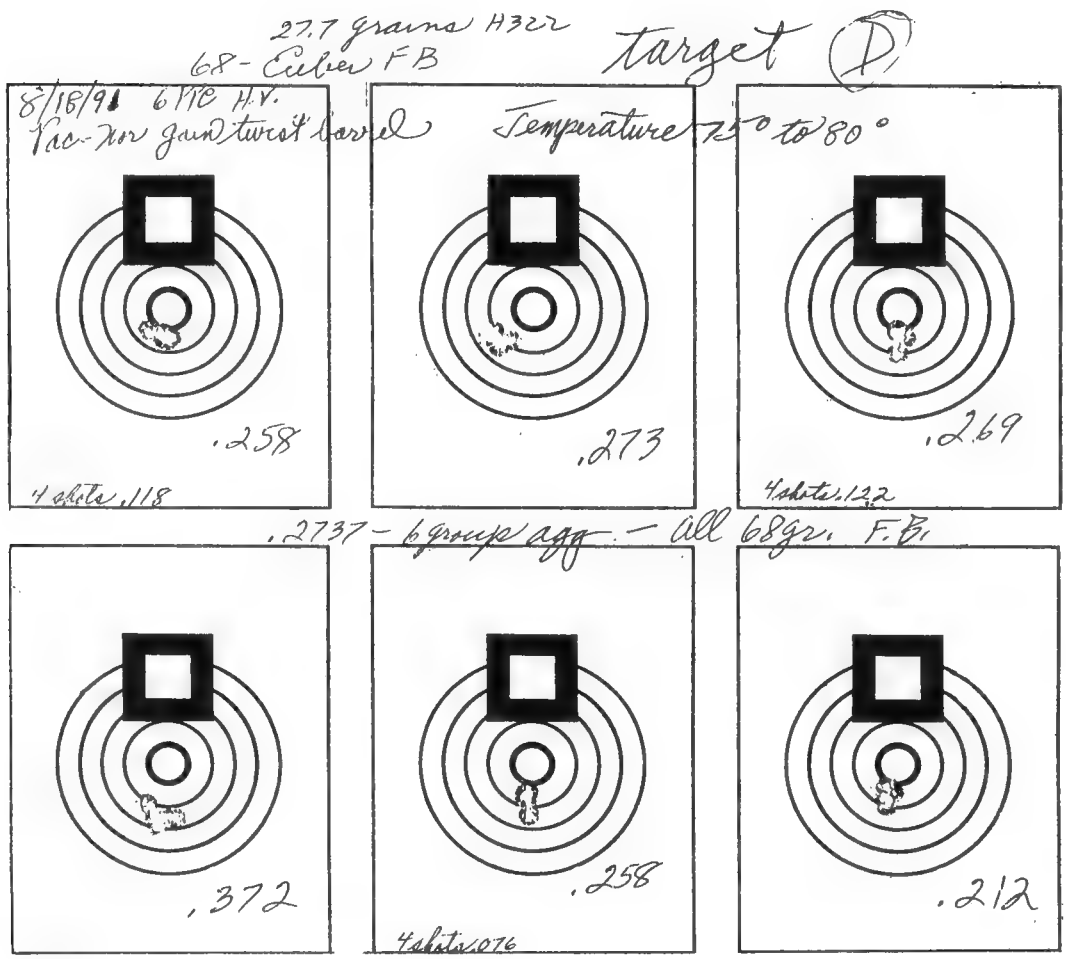

group #1
8/9/91
6 PPC H.V.
Pac-Nor gun twist
Strong head winds and light drizzle
group #2
Strong head winds #2
& heavy pouring rain all over gun and bench
got cooler
Group #2
target C
and into muzzle end
Estimated
temperature 60°–70°–?
1-fouler
& 2 sighters


27.7 grains H322
68- Euber FB
target D
8/18/91 6 PPC H.V.
Pac-Nor gun twist barrel
Temperature 75° to 80°
.258
4 shots .118
.273
.269
4 shots .132
.2737 – 6 groups agg – all 68gr. F.B.
.372
.258
4 shots .076
.212

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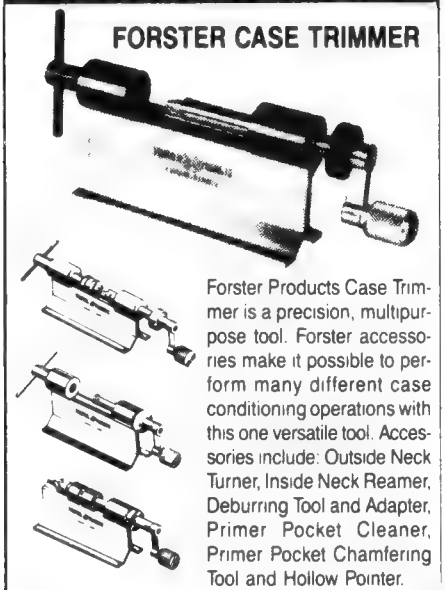

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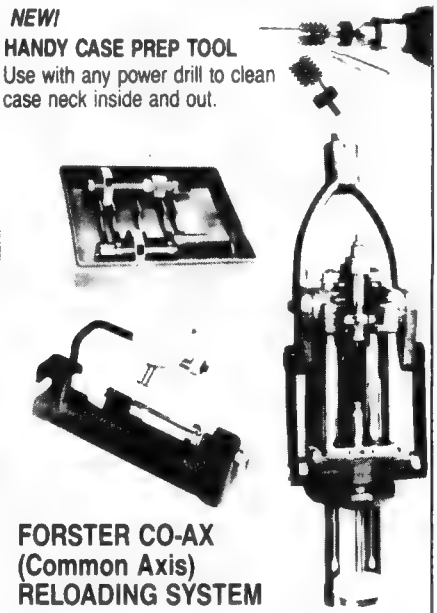

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TEMPERATURE DIFFERENCES

Continued

muzzle may have added to the dilema. That finished that session. I, hastily, put all my gear in the trunk without packing anything in their containers and went home.

Fourth Test Date August 18, 1991 - Target D

This time the temperature was 75° to 80° on a partly cloudy and partly sunny day. Again, I had to shoot with strong head winds coming from between 11:00 and 1:00 o'clock. This time I read the conditions better with no problems in bullet stability. I used the same load with the 68 grain Euber flat base bullets. The aggregate for the 6 groups was a respectable .2737.

Fifth Test Date November 19, 1991 - (No target reproduced for this one)

This last test had a temperature of 62° on a sunny day. I had a barometer which read 30.52" and 45% humidity. It was shot at about 12:30 p.m. with head winds from 12:00 o'clock. I used the same 68 grain flat base bullets, but a different lot of H322. The 51.0 clicks on the Culver would throw 27.7 grains of Lot #12685. This was one of the milder lots of powder. This time the bullets keyholed again, all around my aiming point for about a 7" group. This test showed the temperature conclusively at 62° was enough to tip the balance of whether the bullets would keyhole.

If I had the thermometer during the third test I could have had the breaking point. The first three sighters and the first group was perfectly stabilized. The instability came in the second group when the temperature dropped suddenly and the rain blew in hard. The wind chill factor makes it hard to tell the exact temperature.

The other variable in this last test was the different powder lot. This could be a factor. Our range is not far above sea level. So far the 68 grain bullets would stabilize at a temperature above 75° in the 14.651 ave. twist. They would not stabilize below 65°. What would happen at a higher altitude? What are the other variables to consider? I don't know all of the answers, but I keep searching.

It has been said that 68-70 grain bullets are just barely stabilized in a 14" twist, especially boat tails in very cold weather. It seems incredible that additional slower twist could make such a difference.

Geza J. Nagy

ADDENDUM:

My main purpose of testing the 68-70 grain bullets in this slower twist was to try to establish what temperature was needed to stabilize them. I, as well as others, have experienced instability in very cold weather with the standard 14" twist. This was particularly evident with boat tails.

Obviously, it would have been better to use lighter bullets all the way. I have so many other tests lined up that I don't have that much time. The range conditions are also a factor in any tests.

This test took over one year in order to get the variable temperature changes to test in.

I just got another new barrel; again from Pac-Nor. This one is a seven groove barrel with 13" twist. I tested it once so far with very good results. This time I intend to test heavier bullets (above 70 grains), as well as 68 grains. It is rated as super match grade. It was rifled with some new technology concepts. Some of this I cannot divulge.

I will write about it after further testing. The barrel scan came with it. I was able to cut the barrel where it would be the most beneficial to accuracy.

Geza Nagy

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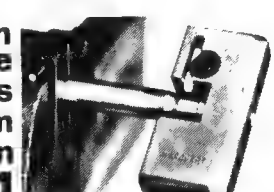

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MORE ON THE 6.5 CALIBER

by

Chunk Youngblood

I read Bob Jourdan's "Project: 6.5 by 55 Improvement" and his previous articles about the 6.5 caliber with a great deal of enjoyment because I've been a 6.5 shooter since 1970. Prior to that time I was a poor young fellow with one shotgun, one handgun, and one old DCM 1903-A3 I hunted with.

I had "tooled up" for the Springfield with a Lee Loader, lots of Lake City match brass and a barrel of surplus 4831. I tried several different bullets and several primers to get the '03 to shoot a couple inches consistently.

This was adequate for my hunting, but in 1970 what I really wanted was a "real" custom rifle: the one rifle that would be perfect for someone like me who could only afford one gun.

I read every piece of gun literature I could get my hands on and I finally landed in heaven when I found Ackley's two volumes for handloaders. These classics kept me busy for weeks and in the end, I knew everything about shooting, loading, wind, actions, ballistics, the works!

This perfect knowledge led me straight to the 6.5- 06. A rifle based on this cartridge would be the best combination of fast, powerful, and accurate. It would even use the hundreds of cheap cases and pounds of powder I had.

This same perfect knowledge took me to the gun store where I visited with the owner, purchased a brand new Santa-Barbara Mauser action in the white and got the name of **the** only gunsmith in town.

When I got to the gunsmith and handed him my action and idea, he looked at me like I was crazy! "Hell — a guy could buy a brand new Winchester for what he'd have to charge me to build a gun in some bastard caliber." The reamer alone would cost $35.00 dollars(!), and be totally worthless after one gun! His mind wouldn't be changed. I talked, I wheedled, I whined (remember I was young) and finally I handed him a carefully hoarded picture of Ben Franklin. He promptly said, "I'll order the barrel right away!"

Now the pain and agony started. The (remember, **the only**) gunsmith said the rifle would take about 3 months to build because it was hunting season and he was busy. He told me to come back in about three weeks when he should be finished with the barrel and I could pick out the wood and he'd finish it up as time allowed.

Well, those three months turned into a year; not really a long delay but, suffice it to say when the big day came I was EXCITED. I picked up the rifle and the reamer and floated home. Since I had already purchased dies, bullets, a press, scale, and everything needed to get shooting I was set to go.

Forming the cases was a breeze; just grease 'em up and send 'em through the full length die. I'd picked the Sierra 140 gr spitzers because I intended to go after elk in a few months. Because I had read all Ackley's books and knew everything, I started with 50 grains of 4831, 10% off the max. I was ready to go to the range.

Boom! DISASTER! The damn gun kicked like a mule and I coudn't get the bolt open on the first round! Still a young man with only several major disappointments as yet, I was near tears.... I couldn't imagine what could be the matter. I mean, hadn't I read all of Ackleys books; two of them several times? That damn gunsmith must have screwed up! Boy was I going to rip him.

I started the mess home and since the drive was several miles I had plenty of time to think and stew. Of course, I'd put my pride and joy in the front seat with me so I ended up looking at the rifle more than I did the road.

As I drove in chagrin some things started coming into focus. First of all, the action wasn't blue-black like the barrel — it was red — and the wood wasn't the beautiful smooth piece of art my dreaming eye had seen — it was rough and the contours were really sort of ugly. Not only that, the muzzle pointing toward the back seat wasn't neatly crowned, there was a deep gouge running across nine o'clock. GLOOM... DESPAIR....

By the time I got home, I had made several decisions. For one thing, I was going to determine the reason the bolt wouldn't open, then find and list all the faults the rifle had. After that I'd take it back to the gunsmith and make him fix it.

I got the bolt out and examined the evidence: the primer was missing, the case was black and the bolt face had a nice ring burned where the primer used to be. The rest of the rifle seemed OK but as I looked at the cartridge case the pictures in the reloading books came to mind — you know, the ones in the front about the basics of reloading — the ones I didn't have to look at very much or read about because I already knew everything?

It turns out, everything I knew didn't include the part about when you form a case from a larger case, the reduction in diameter demands that the brass go somewhere. Nor did I know that the cases I had chosen had the "military" small capacity. My cases were about .020" longer than the chamber of the rifle. My 10% under max load was probably everything that Mauser could take with-

Continued on next page

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MORE ON THE 6.5 CALIBER

Continued

out bursting. I think to this day the "GUN-GOD" looked down on me and said, "I'm going to give this idiot one more chance to figure out he doesn't know everything. If he doesn't get a clue, next time the bolt goes through his very-slightly used brain pan."

The rifle only had the aforementioned defects. Terrible things really, but nothing that meant breach of contract by the gunsmith, only that he didn't think much of his work. I decided that I could fix the major fault, the crown, so I ordered Brownell's supply catalog and purchased a crowning cherry. A careful hand truing with the help of a linen magnifier did the trick.

After trimming the cases for length, I loaded up and returned to the range. I had used the general overall length data given for 30-06 in the several loading books I had acquired.

The first five-shot group was under an inch, .750". I was elated; afterall, everyone knew a minute of angle was almost impossible to obtain. The rifle proved to be a good shooter, always around an inch with the 140 grain bullet and usually under an inch and a half with the 85's. As I found out later in life however, it was pure luck I stumbled on a good load first time out.

Everytime I picked up the thing though, the ugliness made me cringe. As therapy, I started acquiring more weapons, and due to my limited finances, many of them were in poor condition so I decided, "I'm a mechanic and these things can't be as complex as my race cars. I'm going to start fixing them up myself." I determined that I would become a "real" gunsmith some day and make that mauser right.

A job and location change gave me the opportunity to do just that. I was making good money and met a gentleman who introduced me to precision shooting and *Precision Shooting*. My entire life changed. Every month after reading P.S. I became more aware that I had lots to learn and lots to do to the mauser-6.5.

My friend, Paul, had been in the real accuracy game for quite a while and taught me a lot. For instance, my mauser was not one of the best actions available when striving for good groups. He was kind enough to show me the ins and outs of pillar bedding and he worked several hours getting me a quarter-inch improvement in my groups. Up until that time the rifle had really been shot very little, perhaps five hundred rounds.

Paul and I started going to Raton, New Mexico, to shoot metallic silhouette. I found the 6.5 was very good at knocking down steel when the rifle and I did our parts. The 140 grain spitzer had given way to the 140 grain MatchKing (another tenth-inch improvement) and the rifle was grouping in the high sevens.

The next task I tackled, in an effort to improve the mauser, was turning the necks. I sent money to Marquart for his neck turner and cleaned up my cases. Quickly I started splitting most of the necks on each trip to the range and realized in order to alleviate the problem I'd have to redo the chamber. Luckily I still had the reamer that started this story.

I measured several of my cases (ones that were brand new), then turned the necks till they were uniform, made a drawing and sent the reamer off to Clymer for a regrind. I specified .001 over the measured case dimensions. When the reamer returned all I had to do was screw off the barrel, shorten and rechamber it. One small problem cropped up however, I had no lathe, no mill, only the several gunsmithing hand tools I had acquired. Always the cautious one, I looked around for used machines, bought them immediately and started turning metal.

It was several months before I felt confident enough to attack my barrel. By that time I had read enough of P.S. to know the key to an accurate rifle was to get everything parallel or perpendicular to the bore. I can clearly remember that first chamber taking me hours and hours to produce. I was determined to do the job right and be able to do every subsequent job right. Consequently, there were literally dozens of tools and fixtures I had to produce; cutting tools, mandrels for the receiver, collars to run in the steady rest, ballbearing fingers for the steady rest, inside threading tools for the receiver threads and even a barrel vice to start and finish the job. When I finally screwed on the barrel and torqued it, I really felt I had actually become more than a pipe threader.

More as training than need, I built a set of size and seat dies (I already had a fine set from Neal Jones). Next I gave the cases the full treatment; sort by weight, remove the flash hole flower, cut the primer pockets and I even polished them inside and out. I filled the case to the bottom of the neck with 4831 and seated the Sierra 140 MatchKing to engrave the lands. All I did was influenced by my constant reading of P.S. and the thoughtful guidance garnered from it.

It turned out everything I read and all the things I had learned from P.S. bore fruit. The old Santa Barbara Mauser,

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with all the parts running true with the bore, in a pillar-bedded ugly old board produced groups in the threes, and kept producing groups in the threes. The velocity with 52.5 grains of H4831 ran 3178 for an average and the standard deviation hovered around 7 to 9.

I have since chambered several 721 and 700 Remingtons (P.S. taught me what to look for in commercial actions) in 6.5-06 with very similar results. I'm as sure I'll get good results with this caliber as I am when I build a 6PPC (good being relative to the large capacity case, ie, .3" as opposed to .1" groups).

The mauser rifle has thousands of rounds through it now (most of them during hot, nasty silhouette matches) and still groups under an inch. It sits most of the time these days however; turns out I spend most of my time at the machines chambering barrels and building rifles for other people.

Mr. Jourdan's stories in P.S. about the 6.5-55 makes me want to put another barrel on the mauser and bust some caps. Sierra's new 160 MatchKings might be the ticket for all those rams that got away. I think his comments about the Newton are true, but it didn't die in 1938. It still exists as the 6.5-06.

One of the reasons the 6.5 works so well is that I designed the chamber around a good case, I didn't try to make a case fit an existing chamber. I have used this method many more times over the years and have yet to produce a real stinker.

If one is planning to use a certain case, blow out the sidewalls and change the shoulder angle, I feel the first and most important step is to obtain a number of cases of the same lot number and determine that they are of good quality, particularly in regards to concentricity. A reamer should then be designed with specific care regarding the existing cartridge case head area in mind. A chamber that is cut close to the case head dimension will support that portion of the case and allow for quick and accurate fire forming.

I have proven this with another case that works well with the 6.5 bore. I call it the 6.5 K.T. π. My girlfriend (Katie) had broken her neck in the recent past and I started thinking about the 6.5 K.T. π as a low recoil cartridge as a basis for building her a rifle. Taking out all the body taper and changing the shoulder angle to 40 degrees on the basic .308 creates a case with 55 grains water capacity. Just the cartridge that Mr. Jourdan is searching for.

I've only chambered two rifles in this slightly modified Ackley design, but reports from a varmint shooter in Texas gives it subquarter-inch capabilities. I built his rifle on an unsleeved xp-100 with Ed Shilen's excellent nine twist barrel. The Texas shooter said his 1/4 minute and smaller loads came with H-414 powder and the Sierra 140 grain MatchKings we had designed the reamer for. Either the 6.5-06 or the K.T. π will do what Mr. Jourdan desires without the bolt face problems or need for hard to find brass.

If other shooters have an interest in the 6.5 caliber, or would like to have a rifle chambered, I'd love to hear from them. If enough shooters start talking about, and shooting, the 6.5 there's a chance we'll finally get someone to develop a good custom bullet for it. There must be good potential for the bore size when one considers the results that have been achieved by myself and others with commercial bullets.

As I believed when I first started with the 6.5-06 in 1970, it is fast and powerful. It is also very accurate given the materials that are available. If the caliber is given the development it deserves real benchrest accuracy is possible.

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THERE IS NOTHING NEW UNDER THE SUN

by Frank D. Randall

The assistant editor's article in the December, 1991 issue concerning lubricants brought to mind some extensive testing along a generally similar vein that was conducted prior to World War I. The testing was extensively described by no less than the redoubtable Colonel Townsend Whelen in one of his very first published books, the 1918 dated "The American Rifle". The late Colonel was one of the giants of American rifle accuracy, and arguably the single most influential journalist in this field for the 20th century. It was he who coined the phrase "Only Accurate Rifles Are Interesting". Finally he was one of the most influential persons involved in the early days of organized benchrest shooting.

Anyway the good Colonel was a mere Major back then, and along with certain other shooters of his day had the lurking suspicion that just possibly "It was a sort of mechanical cruelty to shoot a jacketed bullet through a steel bore without a lubricant". He reported in his aformentioned book that a lubricant intended for automotive use, called "Mobilubricant", and manufactured by the Vacuume Oil Company of Buffalo, New York, worked satisfactorily as a barrel and bullet lube for jacketed bullets. The loaded round was dipped into this thick, yellow grease so that only the exposed portion of the bullet was covered, and then twirled around so that a thin, even coating was applied. It was discovered that when the rifle was fired with bullets so lubricated it required from one to two minutes less elevation at all ranges. In many cases it resulted in better accuracy, and the bore did not accumulate metal fouling as when fired without lube. He further found that the accuracy life of the barel was doubled, and stated that the use of this Mobilubricant was almost universal "among well informed target shots".

Whelen's experience with this lube came from using it with rifles such as the Model 1903 Springfield rifle in .30 Government 1906 caliber. He wrote at the time that it coated the bore most tenaciously with a covering that resembled celluloid. It was a smooth, even coating that enhanced the passage of the jacketed bullet through it. If it required less elevation "at all ranges" it is only logical to conclude that velocity was increased. The good Major Whelen believed in cleaning his rifle at the end of the day's shooting, and did so with ammonia on a patch to remove metal fouling. This of course removed, each time employed, the grease coating in the rifle bore. However there was another method in use in those days. Some shooters did not clean the bore whatsoever, EVER. As ridiculous as this may seem to today's benchrest shooter, who feels that 15 rounds without cleaning is stretching things to the limit... this system worked, and worked well, for those shooters prior to The Great War. The trick was to push a patch lubricated with Mobilubricant through the bore at the end of the day. The next morning a dry patch was pushed through, and you were ready to shoot. This system worked only if the rifle was to be fired daily, or at least almost daily. It did not work well if the rifle was used periodically, and left unfired for a number of days, because the bore was found to rust. After using the no cleaning method, if the bore was thoroughly scrubbed it was found to be completely ruined.

The United States Marine Corps conducted their own test with Mobilubricant, and Whelen published it along with his own comments. Captain D.C. McDougal was the officer in charge, and reported that he used four rifles, fired from machine rest. Groups were fired at a distance of 600 yards, thirty shots on each target. Although Captain McDougal did not give the exact nomenclature of the rifles used in his testing it is only logical to conclude that they were Model 1903's in .30 Government 1906 caliber since, to the Corps, along with all the other U.S. services, that was THE RIFLE. As Bill Maulding expressed it... "Now HERE'S a rifle! And not a damned peppergrinder!" At any rate, two rifles at a time were fired in two machine rests; one was fired dry, and one was fired with all cartridges lubed with Mobilubricant as described above. It is very important to stop here and take note of the rapidity of fire used in the tests. Captain McDougal said several times in his report that the rifles "were fired as rapidly as possible". Remember now, the groups were "thirty shots at each target". After firing the thirty round groups the two rifles were removed from their respective machine rests, and the other two rifles took their places. The dry rifle was thoroughly cleaned with ammonia for metal fouling, but nothing at all was done to the greased rifle. For the first four hundred rounds the dry rifles "gave groups much better than the greased rifles", and had the tests been concluded at this point the wrong conclusion would have been reached.

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However at the four hundred round point the accuracy from the two greased rifles began to improve steadily... until they began to exceed the accuracy of the dry rifles. At five hundred rounds the bores were measured, and the dry rifles showed some belling at the muzzle, while the bore diameter of the greased rifles had decreased to .304" (point three zero four inch). It was found that the bores of the greased rifles had a hard, smooth, somewhat elastic lining, apparently some four thousandths thick. The greased bores had not been cleaned in any manner, and while they showed some slight rusting after a damp night, they shot well, right from the beginning when firing resumed the following morning.

After one thousand rounds had been fired the dry rifles were found to be badly belled at the muzzle, and gas cutting was visible in the throat. There was a slight tight spot about ten inches from the muzzle in BOTH dry rifles. No explanation was given for this. Also, at this one thousand round checkup, the greased rifle bores measured .303" (point three zero three inch), but after the first lead slug was pushed through and measured the bore diameter increased to .304" (point three zero four inch).

The tests then continued on from there until three thousand three hundred rounds had been fired from all four rifles. At this point the two dry rifles gave up the ghost. Groups fired with the two dry rifles had become so large and scattered that many rounds went off the paper, and a constant repositioning and resighting became necessary to keep the center of their groups on the paper. No further testing with these two rifles was attempted, since it was now obvious that practical accuracy was impossible. However the two rifles that were being fired with greased bullets WERE STILL STEADILY IMPROVING IN ACCURACY, so testing was continued with these two rifles only. At this point one of the two rifles was cleaned with ammonia, and then fired for accuracy. The groups were found to be "considerably larger". It was concluded that the practical accuracy had been ruined by cleaning the Mobilubricant out of the bore. Two hundred rounds of ammunition with greased bullets were then fired through this rifle alone "as rapidly as possible", and groups measured. While the use of these greased bullets did help to bring this barrel back, and accuracy did measurably improve, it was never quite as good as the rifle which had never had the lube cleaned from the bore. Firing was continued with greased bullets in the rifle which had never been cleaned. Accuracy was consistent until the seven thousand round point, at which time accuracy began to deteriorate. By the time that seven thousand seven hundred rounds had been fired (remember... all as rapidly as possible) accuracy had deteriorated to the level reached by the first two dry rifles... at three thousand three hundred rounds. At this time testing was discontinued.

You may draw your own conclusions as to how long these barrels might have lasted if they had been fired slowly. The Marine Corps report stated that the barrels got much hotter than normal. As a matter of fact, dear reader, you may draw your own conclusions about the whole test. I have simply reproduced the results as reported in Townsend Whelen's excellent book, written prior to World War I. I will close with the observation that he was, and is, considered an unimpeachable authority on rifles!

Y're O'bt S'vt;

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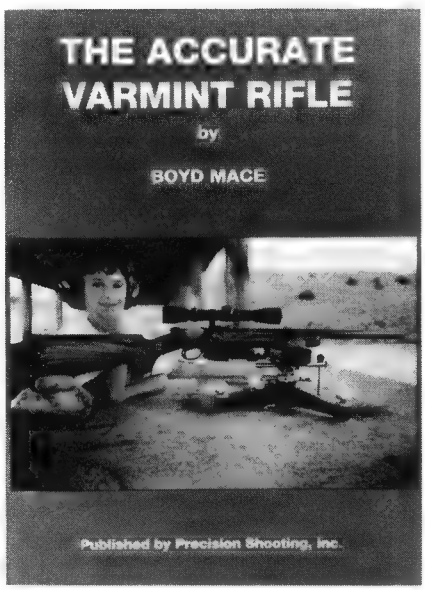

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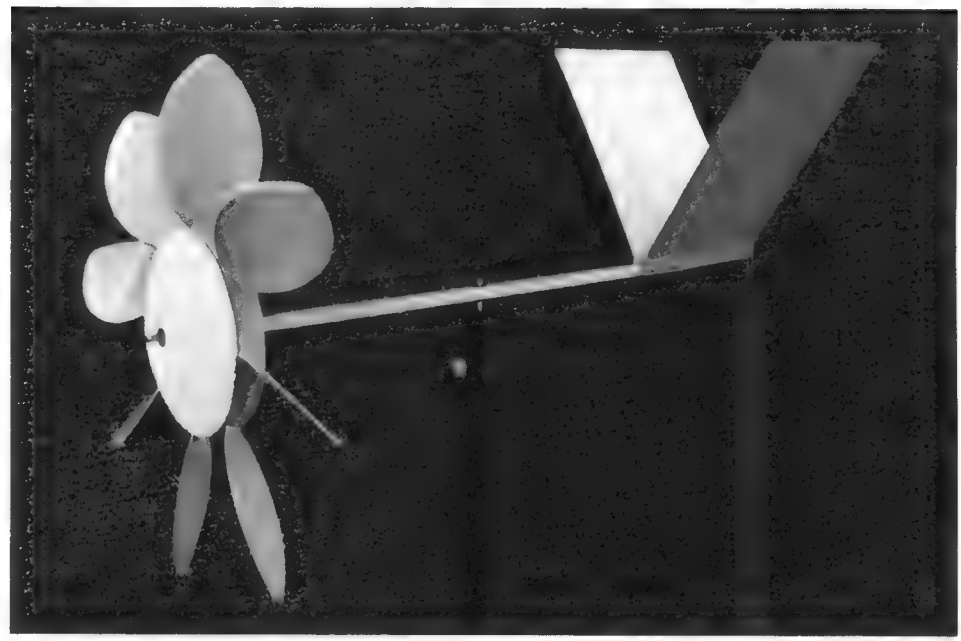
SINCLAIR RANGE FLAGS

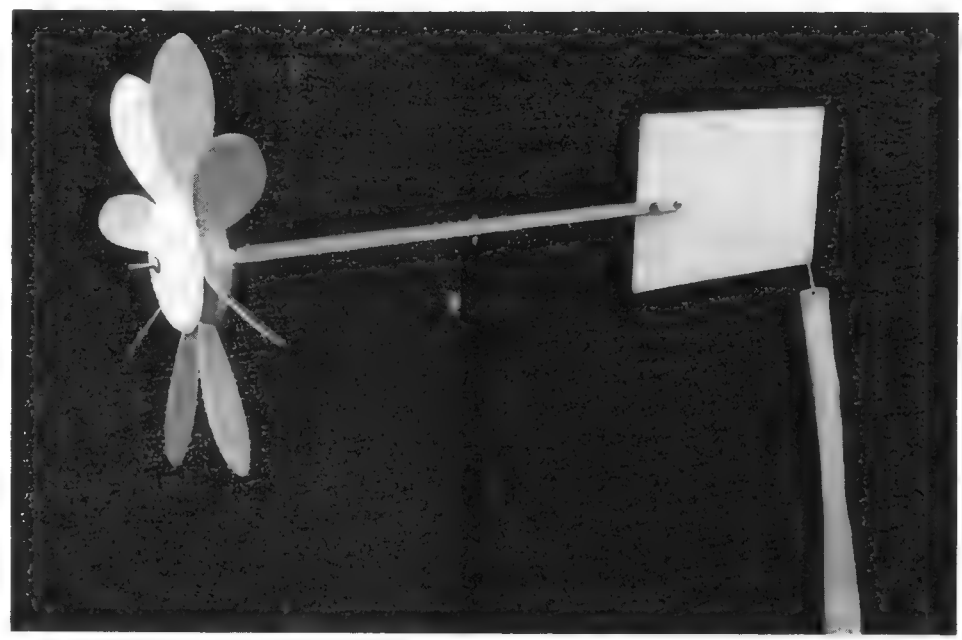
John Gammuto

Sinclair International has been selling a simplified-form wind flag for as long as I have been doing business with them. Looking through old checkbook ledgers, that's been quite a number of years. To know Fred Sinclair is to know he does make changes to his product line for the sake of change. He will remove something from his catalog if one of two things occurs; the product has little or no relevance in the scheme of things today, or something better has come along. The later is the case with respect to his new "wind cheeters."

Sinclair's catalog now features two distinct type of flags. The first is single-vaned with a 12" daisy wheel and the other employs a double-vaned design with a 14" daisy wheel. Both flags are ruggedly constructed of bar stock aluminum, come completely apart for compact storage and conveniently reassemble in seconds. The aluminum is professionally anodized, and can be painted over if you prefer to "customize" them a bit to suit your own esthetic sense. Most people will find them easier to see in the field and if they paint them with high visibility florescent colors. Red/Orange and Green are the most common colors seen these days. Fred indicates in his descriptive literature that it is wise to paint them a different color on each side and paint at least one of the daisy wheel vanes a different color. This enables the shooter to better judge the wind value of the free-spinning wheel.



Large wheel, double-vaned flag.



Small wheel, single-vaned flag.

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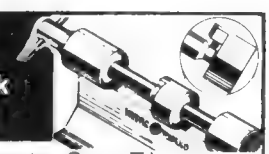

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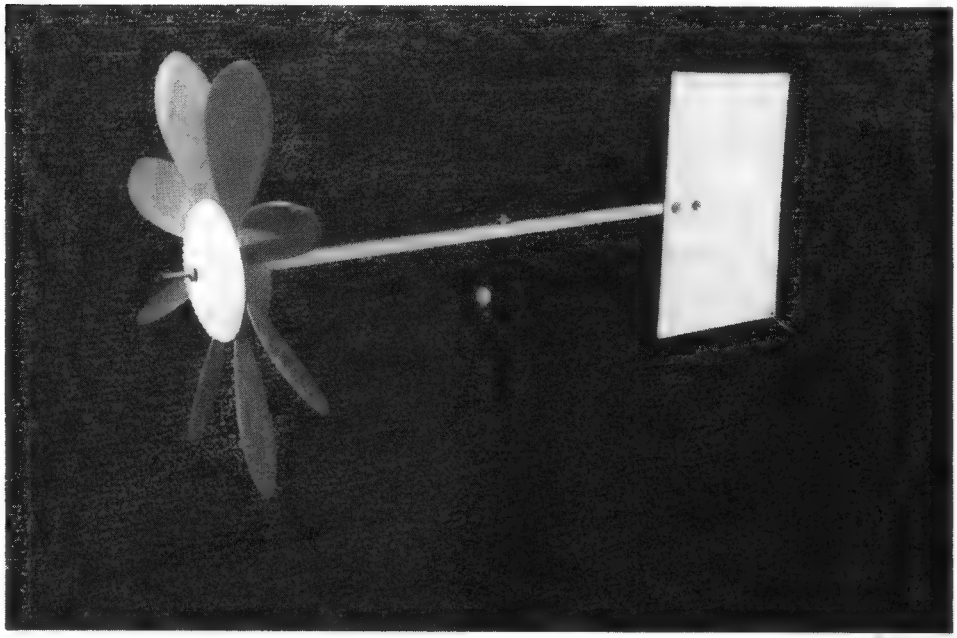
The double-vaned flag comes with one red anodized vane and one clear vane. The single vane flag is anodized red. Each flag comes with all the hardware necessary to facilitate assembly and also includes a few special purpose flag assembly clips. These things over the course of time have a tendency to get misplaced or lost. I especially appreciated this aspect of the flag package because loosing things happens to be one of my fortes. When it's raining (Kelbly's Range, North Lawrence, Ohio) and I'm desparately attempting to collect my flags at the end of the match I take a lot of shortcuts and usually loose or break something. Sinclair's attention to detail in these matters is much appreciated and comes from his own first-hand experience on the match circuit.

The flags are designed to fit on 3/8" tubular steel or solid rod which can be purchased at most hardware stores, or can be found on the end of conventional photography light stands like those sold by the Smith Victor company. Rods and light stands are not available from Sinclair's catalog. They are readily available through many outlets.

So you have an idea of just how compact these flags are, the vanes measure 6" X 9". The overall length of a fully assembled flag measures approximately 23". Note that the vane on the single flag can be rotated 90 degrees to suit your own personal preference.

In addition to their functional value, you are getting good value for your money. The small wheel, single-vaned flags sell for $17 each. The larger double-vaned flags go for $21 each.

I've had a set of these flags bouncing around in the back of my pickup truck for three or four months now. They're not any the worse for the experience. The only time you're going to have to replace one of these flags is when you lose one. Shooting them won't even necessitate it. Believe me, I know.



Small wheel with vane rotated 90°.

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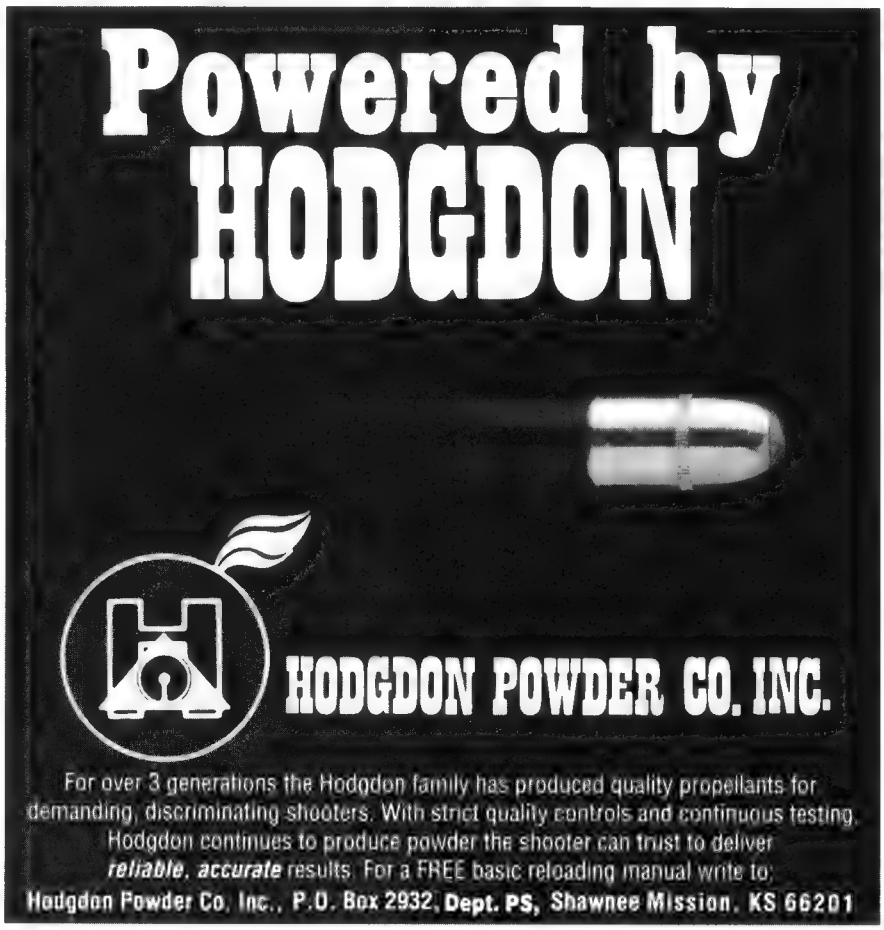
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MERRILL MARTIN

Dear Mr. Martin

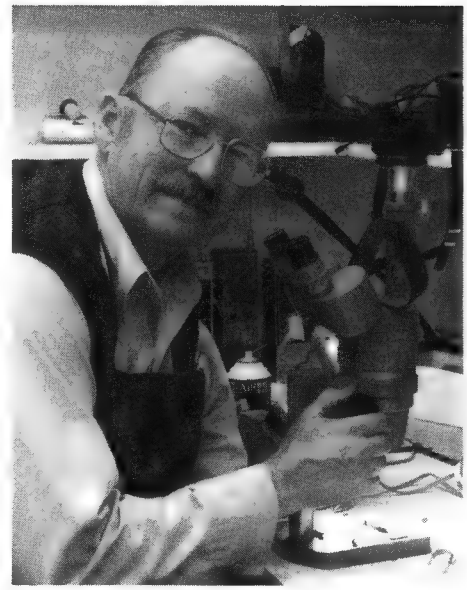
Bore conditioning and accuracy

By one of the vagaries of the U.K. mail system, the November and December issues of P.S. were delivered on successive days — incomprehensibly the December issue had affixed thereto an official apology for late delivery! This accident served to ensure that the two copies were read together, with the consequence that light dawned in my mind on what was happening in the many experiments you have reported on bore fire lapping, which I interpreted in the context of several others on bore conditioning of new barrels, and in particular, that by John L. Gammuto in the December issue.

You may recall that in a previous letter, I suggested that further progress in the realisation of accurate firearms would now depend, in substantial part, upon the application of a deep understanding of what was actually happening in firearms and the utilisation of the associated engineering theory. I offer the following remarks in that light.

As is not uncommon, the explanation of what is happening in bore conditioning is to be found in relatively ancient research. This is work carried out in a number of countries from 1940, on fundamental studies into the sliding contact of surfaces and is to be found in reference works on bearings and lubrication theory.

Crucially, it was found that all materials made contact only on the microscopic peaks of their surface roughness and that if the sliding velocity was high enough the temperature of the tips of the peaks could rise to well in excess of 1000 degrees C. This could lead to actual friction welding of the peaks if their chemical composition permitted this to happen and, because of



the tiny size of the peaks, this would occur for all practical velocities. The friction force then observed was that required to make and break these minute welds. If, in addition, the surface was rough then further to the welding process, the roughness tended to force the contacting surfaces apart thus increasing the total friction.

This situation leads directly to the measured coefficient of friction (sliding force/applied load) of around unity for metals under unlubricated, but not chemically clean, conditions: factually, the friction coefficient is 1.2 to 1.4 for copper on copper. On the other hand where sliding contact is against a hard material, such as a ceramic, and welding does not occur, then the friction coefficient is much lower at around 0.2. Under boundary lubrication — which can mean poorly lubricated conditions but can also mean favourable trace surface contamination — the friction coefficient is much reduced to values in the region of 0.1. Dependent upon the actual degree of metal to metal contact, the individual welds may not merge into a continuous high level of friction and the friction coefficient can fluctuate between that corresponding to welding and that to boundary lubrication.

In the case of a rifle bullet the pressure applied to the bore surface by the bullet, is substantially equal to the powder pressure giving an average friction force which is the product of the bearing area, the powder gas pressure, and the average friction coefficient. For a .308 this would be around 1000 lbs x friction coefficient. However, as noted, the welding process occurs randomly, and supposing that an area on the bore wall, which is already coated with jacket copper, should happen to weld to the bullet in a square patch which is of landwidth dimensions then this will produce a force along the borewall of around 175 lbs — which is a snatch applied momentarily to both bullet and bore wall. The force will only last for a time of about one microsecond but it is applied offset from the bore centreline. This force will thus start both to tip the bullet in the bore and to bend the barrel. Both of these two processes may ultimately result in group deterioration, but to what degree this becomes evident on the target will depend on how much interference occurs from other randomly occurring snatches as the bullet proceeds up the bore: clearly the effect of these snatches can increase in either an additive manner, or be reduced in a subtractive manner. Obviously, if this offset snatching could be totally prevented then improved grouping would be seen.

It thus becomes obvious that, for the several foregoing reasons, abrasive coated bullets, bores which have been carefully lapped by the use of several laps — including particularly thereby fire-lapping,

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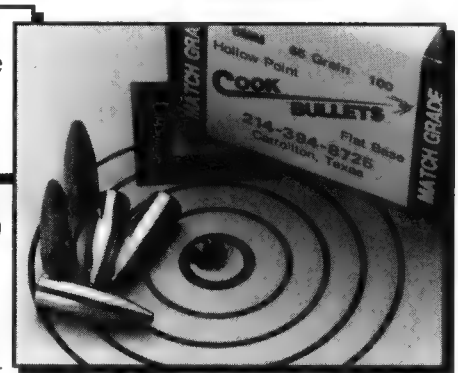

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and bores which have been carefully conditioned by "fire and de-copper" procedures — which last is recognisable as a running-in operation whereby the larger surface asperities which casue friction welding are worn away — all result in improved shooting because they all have a more uniform friction between bullet and bore.

It is therefore apparent that any significant deviation in surface condition, reducing or enhancing the bore surface tendency to weld to the bullet, will have an influence on grouping. Thus, the friction coefficient of copper on steel is somewhat less than that of copper on copper because the copper-steel welds are weaker. However, the breaking of these copper-steel welds leads to a transfer of copper onto the steel so that the friction characteristic of copper on steel will tend to become that of copper on copper. Worse than that picture, gas blowby past a lead bullet sprays a mist of molten lead in front of the bullet which provides a new contaminant ready to be embedded into

Continued on next page

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MERRILL MARTIN

Continued

the bore surface and then commence weld formation to the bullet body. Gas conditions are aggressive enough for this mechanism also to be at work with jacketed bullets. Clearly, the bore contamination condition needs to be stable and effective gas seals like the "P-wad" have a very significant part to play in maintaining an initial bore condition.

The bore conditioning lubricant "Friction Block" reported by John J. Gammuto similarly falls into line. It was reported in the friction research that "a good boundary lubricant does two things: (1) it reduces friction between metal surfaces by as much as 20 times; but (2) it reduces pick-up (welding) by a factor of 20,000 or more." This means that the snatching on the bullet and bore wall is similarly reduced and the bullet slides more smoothly through the bore. It is known from experiments in Australia that a product "Tetra Gun L" containing fluorpolymers, i.e. teflon related, had a favourable effect on both velocity and groups — the latter in some cases were halved in size. It was claimed that one application was good for 1000 rounds. Experiments carried out here in Scotland by a shooting friend using an industrial teflon product — which just happend to be to hand in his workshop — had the same effect on grouping.

Teflon is a remarkable substance. It is effective as an extreme lubricant and is known to carry sliding loads without lubricant breakdown up to around 50,000 psi. It acts to transfer itself onto BOTH sliding components, so that the friction coefficient is that of teflon on teflon at about 0.05. I suspect that its heat breakdown products might even themselves act as extreme pressure agents in a way similar to other e.p. compounds. It is regretable that the constituents of "Friction Block" are not stated: I should think it a good bet that it too contains a fluorpolymer.

I should expect from this analysis that the best bore condition would therefore be obtained by the use of several SEPARATE laps, as in fire lapping, in order to get rid of ALL of the "mountain peaks". This should be followed by teflon coating. Effective gas bullet seals will undoubtedly also help.

I hope you will find these comments of interest.

Yours sincerely
A.B. Bailey
Endrickvale
Fintry
By Glasgow
G63 0YH
Scotland

Dear Mr. Bailey:

Your bore conditioning letter is a most profound observation of a very complex situation. Everything we have learned in the engineering field that seems so logical, for some reason, falls completely apart when it comes to rifled weapons. It is very frustrating.

Preceding all the conditioning, of course, is a uniformally sized bore and twist, which I've tried to accomplish by my pressure lapping. I can attest that it does end up a very smooth bore after examining it with a bore scope. The copper, I've observed, in such a smooth bore after firing twenty or more rounds, seems to be more of a fine wash, almost like a polished, plated, surface. Only a few strokes of a patch with Gold Medallion would remove it. The hard, shiny, carbon was another thing and really tough to remove. The matter of friction would be great if we had a method to measure it under the conditions of firing the bullet down the barrel. I like to use the expression "controlled friction" as opposed to a bullet that "free-wheels" down the barrel and upsets the combustion process and chemistry of the powder normally used. Back pressure must be kept against the gas. My own personal experience has shown me very poor overall results with products using teflon. Everyone will jump on me for that statement, but my evidence is too overwhelming. All of my first experiments were with teflon wads and lubes. Yes, they were very slippery. Consistency was the problem — not the same from day to day, or on a string of shots. Almost without fail, the first shot or two were fliers.

Rather than treat the bore, which would progressively deteriorate, I went the route of treating the bullets. You may have read my earlier writing on Tumble Coating Jacketed and Cast Bullets. This is actually a double coat. The first is with moly powder, impact-plated into the bullet surface with steel shot and lightly polished with corn cob grit. The second coating is with powdered carnuba wax, again impacted over the moly, sealing its surface (about three to five hours time).

Bullets so treated leave behind a little of this coating and help reduce the copper fouling, making the bore even easier to clean. Clean patches you will never get as the moly just keepts coming out of the pores of the steel, leaving dark patches — but , not green ones.

So far, almost without exception, the coated bullets shoot more accurately and over a longer period ot time, without fouling, than bare bullets. And, the coating doesn't rub off the bullets. The part I really like is getting the first shot with the rest of the group.

This bullet coating process started with jacketed bullets and worked even better with cast bullets when raising their velocity. Tumbling with the steel shot created fine dimples upon the cast bullet's surface and helped create a very uniform boundary lubrication, even though regular lube was in the groove.

My cast bullet lubes are very simple — 30 weight mineral oil in a high melting point soap base material, Texaco Taurak 250. For wads, I've even found two better materials than the LDPE, and that is polyurethane (very expensive) and soft, clear PVC (very cheap). At the moment, the 1/16 PVC is shooting even better groups than any other wad material. Also, it has a high friction drag. It works great behind plain base cast bullets at up to 2,200 FPS. Recovered wads look perfect!

Yours truly,
Merrill D. Martin

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MARMOTA MONAX

REMINGTON 700 PSS - A STUDY IN FRUSTRATION PART II

Jerry Wm. Faul

The saga of the Remington 700 PSS that wouldn't shoot smaller than two (2) inch groups at one hundred yards continues. Several things have happened since the last article appeared in the April issue of PS about the problem with aluminum bedding blocks used in the H-S Precision stock that is found on the Remington 700 PSS.

So that we don't have to test our reader's memory from one issue to the next, remember that the PSS stands for "Police Sniper Special." It's the traditional 700 action with a BDL floor plate and magazine well. The stock, I have found out, is made by H-S Precision of a synthetic material (perhaps graphite/kevlar) with an aluminum bedding block. The action and barrel finish is black matte. This particular rifle is in 223 Remington. It has a Remington heavy varmint 24 inch barrel. I also now know that the rate of twist is 1:12; which helps explain the rather poor performance with Federal 68 grain HP match ammunition, but not with 50 and 55 grain bullets.

The initial problem with the rifle was thought to be a bedding problem. The rear action bolt was extending up into the bolt race way. It was not enough to cause the bolt not to open, but definitely too high for comfort. I clamped the rifle in a decker rifle vise. I added other clamps to hold the stock as rigid as possible. I then held the end of the barrel and moved it right and left. Watching the rear end of the scope, I could see it move right and left with the barrel. An audible "clunk" could be heard each time I moved the barrel. The action was just not sitting properly in the aluminum bedding block.

Back it went to Steve Acel of Log Cabin Arms. I told Steve my findings and he decided to look further into the bedding problems. What he found is very interesting. First, the main problem is that the aluminum bedding block was set too low in the stock during injection molding. This caused the stock material to over flow at the top of the bedding block creating a gap of between .010 to .015 between the bottom of the receiver and the bedding block. Only the upper parallel edges of the aluminum bedding block, which were covered with stock material, were making contact with the receiver. Tightening the action screws only compressed the stock material; it did not tighten the receiver into the bedding block. The rear of the recoil lug was not in contact with any surface. The magazine well was overfilled with stock material so that the magazine assembly set cockeyed in the stock with contact its entire length on both sides. With a Dremal tool, a milling machine and lots of Devcon, all these problems were solved. The Model 700 PSS was now properly bedded.

The rifle still wouldn't shoot. We were able to tighten the group up from a solid two (2) inches to a disappointing 1 3/4 inch group using Sierra 55 grain bullets. This rifle would not group at all with 50 grain bullets. Both factory and handloaded 55 grain loads would consistently shoot random, large groups.

The next problem identified was that the firing pin was hitting its shoulder within the bolt housing and the tip of the firing pin was bent. These problems were corrected. The rifle still wouldn't shoot any group smaller than 1 3/4 inches with 55 grain bullets.

I asked the Pres, Bert Rypkema, to discuss the problem with Clarence Hammonds, since I knew they would be talking on some other matters. Clarence said that I was looking at the wrong end of the rifle. My problem rested some place forward of the bolt locking lugs. Either the action threads were not square, or the barrel was threaded improperly, or the barrel was just plain poorly rifled, etc. I was not about to rebarrel a brand new rifle at my expense. So I did what I probably should have done at the very beginning of this rather frustrating experience. I called the Remington Service Department.

Be prepared for a rather large phone bill when you call Remington. I got through to "music on hold" and waited nine (9) minutes for a human being. I explained the problem with the service representative, who I must say was very sympathetic to my problem and suggested that I ship the rifle to the Service Department for them to examine. The rifle was shipped UPS on February 5th, from New Jersey to New York. I called on

Continued on next page

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MARMOTA MONAX

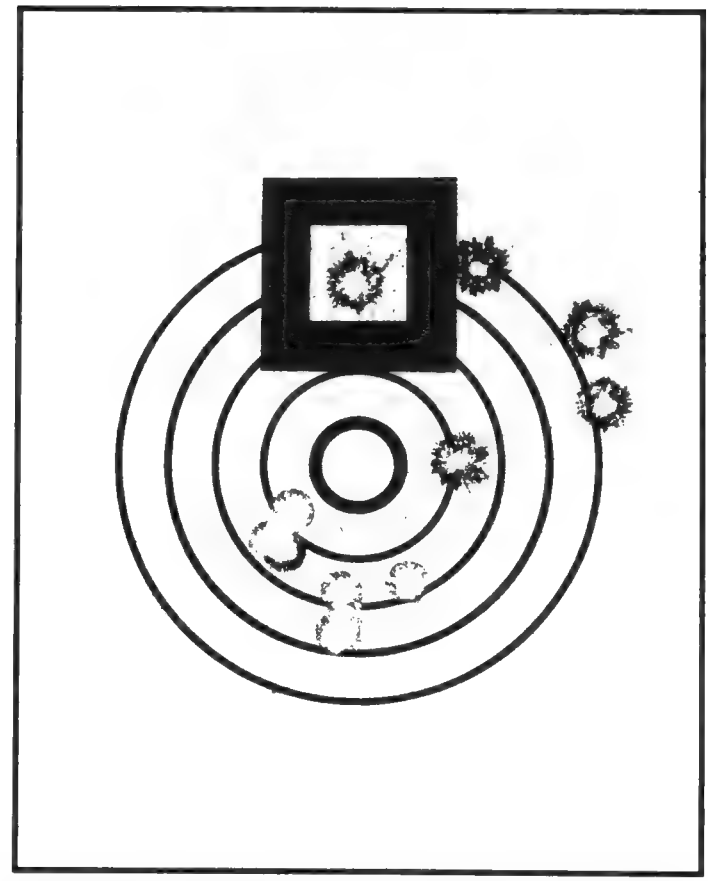
Continued

February 12th. Remington had not received the rifle yet. I started a trace through UPS when I was called by Remington on February 14th to say that my rifle had "just arrived."

I asked the service representative just what tests would Remington perform. I was told that the rifle would be test fired from a fixture at 100 yards and from the shoulder at 100 yards. The rifle should group to specifications or the action and barrel would be replaced. The Service Department does not perform any gunsmithing. It will simply replace any part that is not to specification, in this case, the entire action-barrel assembly.

I called again on March 5th (one month to the date I had originally shipped the rifle). Surprise, surprise the rifle failed to shoot to specification from a fixture. Remington was going to replace the receiver and barrel assembly, but the finish on the "just received" actions and barrels from the production line needed to be re-done. I would receive the rifle in about seven to 10 days, maybe.

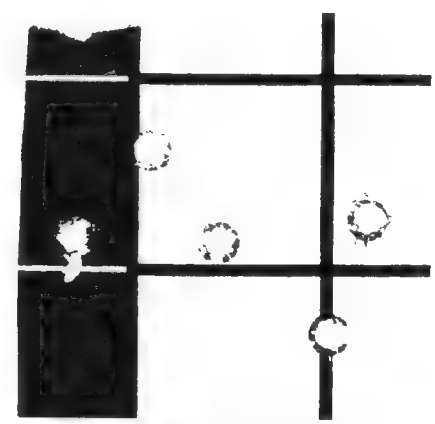
The 700 PSS arrived back on March 19th. The first thing that was apparent was that the trigger was very, very heavy. It measured 6 1/2 lbs. on the trigger pull gage. The rear sling swivel stud was also missing from the stock. I called Remington the next morning and was assured that a stud would be sent to me. Along with the rifle which does have a new receiver, bolt and barrel was a target that was not encouraging. It is a true 1 1/2 inch grouping. I could not tell whether the test group is stringing vertical or horizontal, since there is no indication on the target which way is up (no pun intended). This group according to Remington's Service Department is within specification. So much for the initially stated less than one MOA.



The original PSS grouping at 100 yards. Remington 55 grain factory load.

The new factory trigger was immediately removed and my Neil Jones reworked trigger was re-installed. What a difference. I installed the scope bases and a brand new Weaver 15X target scope. Cleaned the barrel. It was real clear that the barrel is not cleaned after test firing at Remington.

As an aside, the new Weaver 15x target scope is one of the best kept secrets



The replacement PSS factory Sample Target. Load unknown. Which way is up?

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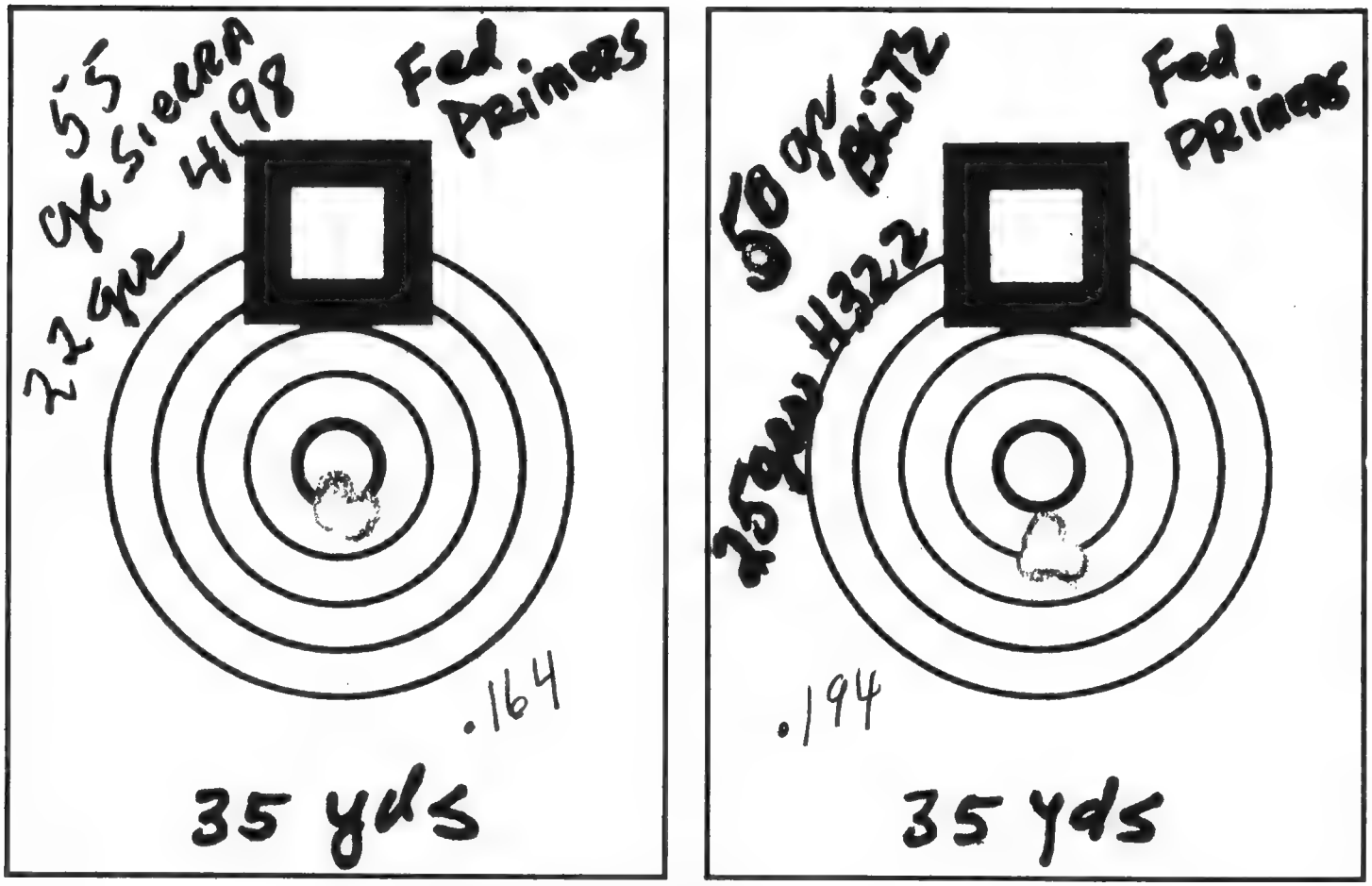

The replacement PSS grouping at 35 yards indoors.

in the varminting community. It is one great scope for the money. It is a true value purchase. The image is clear and sharp. The parallax adjustment allows one to focus from as close as 10 yards to infinity. If it only had a Dot reticle! The adjustments are 1/4 inch and positive. I particularly like the size of the adjusting knobs. Not too big and not too small — just right.

I took the rifle for initial bore sighting over to my local pistol club. We have an indoor range set up that allows us to fire a rifle at 35 yds. The results were a lot more encouraging than the sample target from Remington. With 55 grain Sierra bullets and 22 grains of IMR 4198 the rifle shot .164 — or at 100 that would be .164 X 3 =.492 inches at 100 yds. With 50 grain Blitz bullets and 25 grains of H322 the rifle shot .194 or .194 X 3 = .582 inches at 100 yds. This would then be a 1/2 inch rifle. About the best I've found you can expect right out of the box with handloads.

The 700 PSS has been designated my short range New Jersey rifle for shots held less than 300 yds. I should be able to report on its performance within a month or so under field conditions along with the new Weaver 15X scope.

I'll let you know how the next trip turns out.

Jerry Wm. Faul

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Sinclair International's New Cleaning Rod Guide
RCBS and Redding 17 Mach IV For Dies
Dwyer Hand Held Wind Meter

by

Todd A. Kindler

I thought I had seen it all ..... it just was one of the funniest things I had ever seen at a bench rest match. It happened at last year's Super Shoot as I was loading behind the back of George Kelbly's big building. Our editor, David Brennan arrived Friday morning at the very last moment before the Heavy Varmint class was to begin. He had time to set up his little table and necessary reloading equipment because he was on the last relay with me, but he did not have too much of it to spare. He rushed by carrying his table and equipment. Back and forth, back and forth looking half asleep or ... (I better not say or this could be my last article). I didn't say "Hi" or even good morning as he flew by, maybe out of fear. I just kept my mouth shut. Dave's not a very big person size wise that is, but if you ever would see him at a bench rest match early in the morning you would understand what I am trying to say.

Well, once all the dust settled from Dave flying by us, I decided to wipe my rifle off again and give it a final cleaning. Not long after, I took a chance and glanced up towards the end of the building where he had set up camp. (When you come in late you take the end spot where the rain blows in all over you, and the wind blows half your stuff away but it was his own fault, I would have saved him a place by me, if he would have called, but maybe he did the right thing come to think of it). You can't believe (or at least I still don't) what I saw when I looked down towards him. What I saw was our EDITOR cleaning his bench rest rifle (a 6 PPC nonetheless; remember it was his big idea a few years back to develop a new cartridge to compete with the PPC?) with large black rubber gloves on both hands. These were not just average rubber gloves, they were huge almost to his elbows if you can believe it. Remember when you were a kid and trapped muskrats down in your local creek and you would use arm length heavy black rubber gloves to set your traps under water and in the runways. Well that is what he looked like. What a spectacle right out there on the corner where everyone walks by. This is our Precision Shooting Magazine guru that leads and directs us making an ... out of himself. (I'm gone now.)

Well I took off around the corner busting a gut laughing so hard. I couldn't let him see me laughing (or he would fire me) as I was holding my sides. I peaked around the corner and burst out again this time with tears flying out of my eyes and holding something else as I headed quickly for the restroom. Before I got there I told a half dozen people to go around the corner and check out Dave with his new muskrat trapping gloves (I know I'm history now).

After a bit, I figured I better stop by and tell Dave good morning. As I made my way back I could see several people (the ones I told) looking at Dave and walking away shaking their heads with big grins on their faces. I came up behind him as he was pulling his cleaning rod out of his rifle (6 PPC nonetheless, I wonder whatever happened to his 222 Revenge or the 30 OPUS ??) and said, "Good morning, Dave". When he turned around he looked

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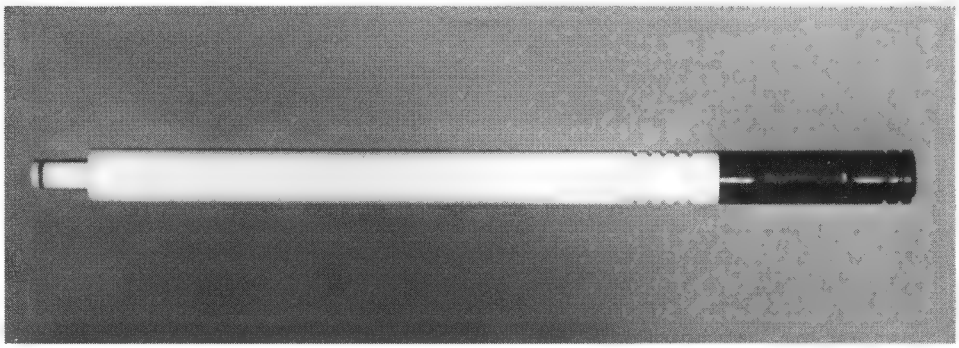
even worse from all the hurrying and commotion from trying to get ready at the last minute. His frazzled look with huge black rubber gloves almost to his elbows started me laughing again, but this time I was standing right in front of him. He asked me what was so funny as I'm sure nothing seemed funny to him that morning. I was afraid to answer, but after hesitating for a moment I said, "The gloves, Dave. The huge black rubber gloves."

Well, that was obviously the wrong answer, and I mean the wrong answer. I knew I should have kept my trap shut. For the next fifteen minutes or so he lectured me and I mean lectured me on the hazards of modern day cleaning solvents when they come in contact with our skin. Boy, did he let me have it. Then he said one of us should write about this you know?

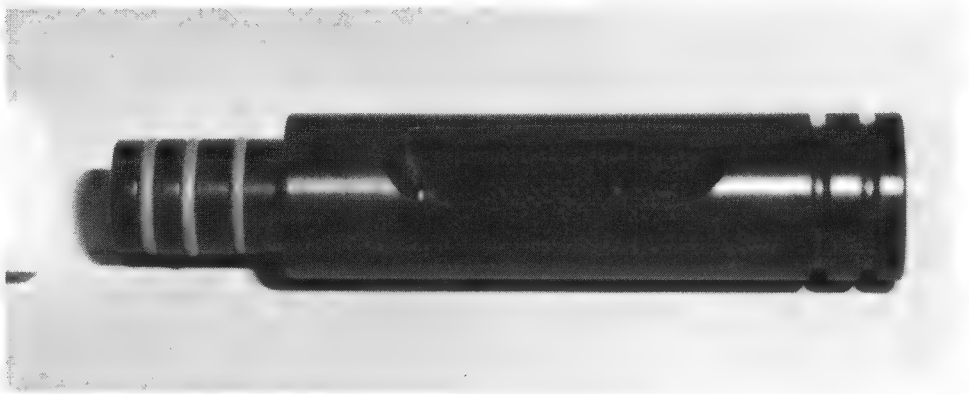
I wanted to tell him his large black rubber gloves were a little (to say the least) overkill, but I was afraid he would really come unglued, again. (I know I'm kapoot now.) It was quite a funny sight that some of the bench rest fraternity will never forget at least not me.

Well, Sinclair International may have something new to help us clean our rifles a little safer and with less of a mess. Eric Sinclair called the other evening with news of a new cleaning rod guide that he wanted me to try. He asked me what action I would be shooting and caliber and I told him to send one for my Shilen short action in 17 caliber (what else). Just a couple days later (typical of Sinclair) a box from Sinclair International was stuck in the door.

Upon opening the box I found a 11" long white and black rod guide with a rubber "O" ring up front. Once I sat my Shilen 17 Mach IV on the bench and removed the bolt, I had the chance to slide the new rod guide in the rifle. This was the first time I had the opportunity to use a cleaning rod guide with an "O" ring seal up front. Mine are all Sinclair's early style with a pin on the side to lock in the bolt



Sinclair's new cleaning rod guide.



A close up view of the rear section showing the solvent slot.

notch. The new rod guide after a slight push not only sealed the chamber area but also did not move through the entire cleaning operation. When you are done, you just give it a little tug and out it comes, very well designed!

The interesting concept of this new cleaning rod guide is the additional short black portion of the guide. It has a 1 3/8" long slot 5/16" wide cut in on one side so you can saturate your patch or brush after you have inserted them into the cleaning rod guide. In other words put your patch on the jag and start it into the new rod guide as you normally would but stop pushing the cleaning rod when the patch is in the center of the slot. Then saturate the patch with a squirt bottle containing your favorite bore cleaner and then push the patch completely through the bore. The same thing can be done with the brush. Once it is in the center of the slot, load it up with bore cleaner and go at it.

Continued on next page

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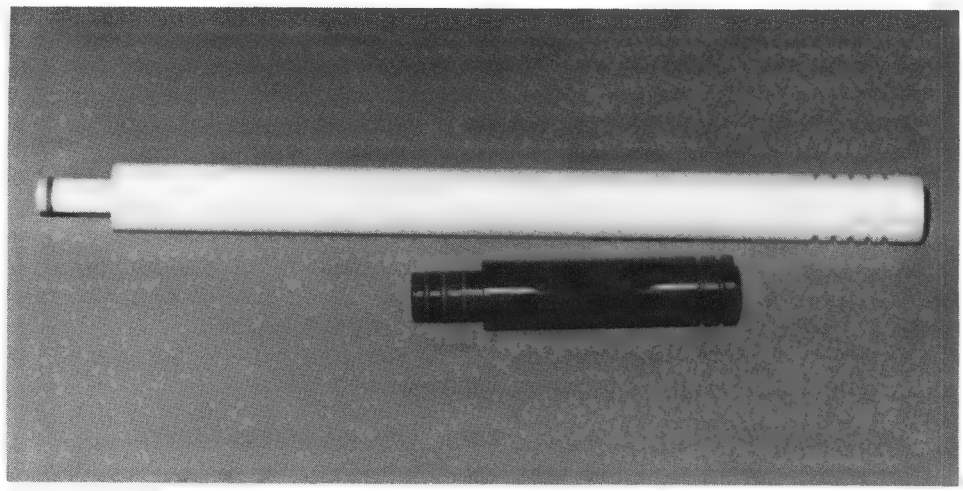
This eliminates dripping all over the place when soaking down a brush or dripping on the stock when inserting a saturated cotton patch. The solvents are not good on our hands (just ask Dave) and certainly do not do the finish any good either.

The slotted black section of the new cleaning rod guide can be removed for cleaning or storage in your shooting box. I found a cotton tip cleans the slot out very well and a quick wipe on the rest of the rod guide with a cotton rag is all that is needed. This rear (black) section has three rubber "O" rings to seal itself to the main part (white section) of the guide. It can be turned 360 degree to place the slot at the best position for you to squirt the solvent in. Some may like to angle it slightly towards the left while others cleaning from the right could turn it that direction. Actually as you insert the complete rod guide, you could orient it either way or straight up depending on your solvent squirt bottle and scope. Both sections have grooves cut on the outside so it is easy to grip when putting it in the rifle or taking it out. Another nice product from Sinclair International who advertises in these pages. Make sure and state what action and caliber you are using when ordering. Also it would be wise to still use a pair of rubber gloves when cleaning and have adequate ventilation in the cleaning area.

One question that comes up quite frequently is how I form my 17 Mach IV cases. This was explained in my series on the 17's last year, but I thought it would be interesting to cover it again with some nice photos. My first 700 17 Mach IV cases were formed in Redding 17

Here the new Sinclair rod guide is in my rifle with the slot turned towards the side for the photo. Normally it would be turned almost straight up.



Sinclair's new cleaning bore guide taken apart ready to store.

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Mach IV form dies. This consists of two dies, a #1 form die and a #2 form die. After lightly lubing the 221 Remington Fireball cases with Imperial Sizing Die Wax, I run them through the #1 form die. Then I relube them very lightly again and run them through the #2 form die (which is also the trim die). Then another very light lube, and I put them through the 17 Mach IV Redding full length sizing die. The #1 form die and full length sizing die requires the standard 222 size shell holder but the #2 form (trim) die requires a 222 size extended shell holder. A little Imperial Sizing Die Wax between your fingers will lube a half dozen cases and will allow the cases to form easily. These 17 Mach IV form dies and full length die set are available from Lock, Stock & Barrel Shooting Supply, Valentine, Nebraska, 69201 - Phone 1-800-228-7925 (Orders Only) or (402) 376-2203.

I have heard a lot of good things concerning RCBS reloading and form dies the past year. Several shooters keep telling me how they are impressed with their new dies. Tighter machining tolerances, hand polished to an 8 micro finish and a lifetime guarantee on all RCBS products are evidence that RCBS is committed to quality. RCBS claims if it ever breaks, quits working they will fix it or replace it free! No time limit or questions asked. After returning one of their products that I have had and used many years for repair, I can honestly say they stick to their word. After I received a brand new reloading tool back from RCBS at no charge, I decided it was time for me to try one of their new die sets. So I ordered a new 221 Remington Fireball to 17 Mach IV form die set from Midway. This die set really impressed me, just like several shooting friends had said. Inside the green plastic RCBS box were two highly polished dies to form the 221 Remington Fireball down to 17 Mach IV. The dies had deep blued steel lock rings using a brass set screw to lock the ring in place.

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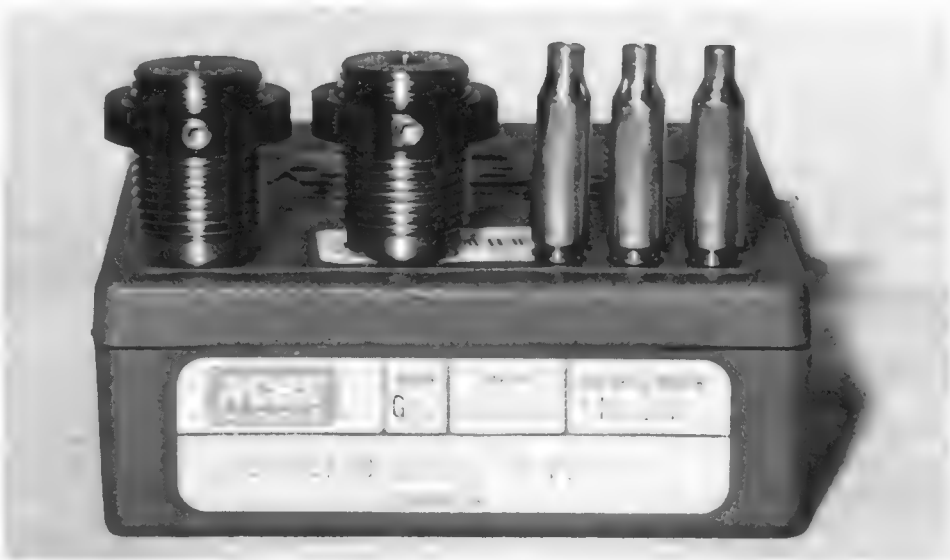
Redding 17 Mach IV forming dies and cases formed to 17 Mach IV and ready to trim. The 223 Remington cases were first formed to 221 Remington Fireball in a set of Redding 223 to 221 form dies.



RCBS 17 Mach IV form die set. A 221 Remington Fireball on the left and the next two cases are as they come out of the dies.

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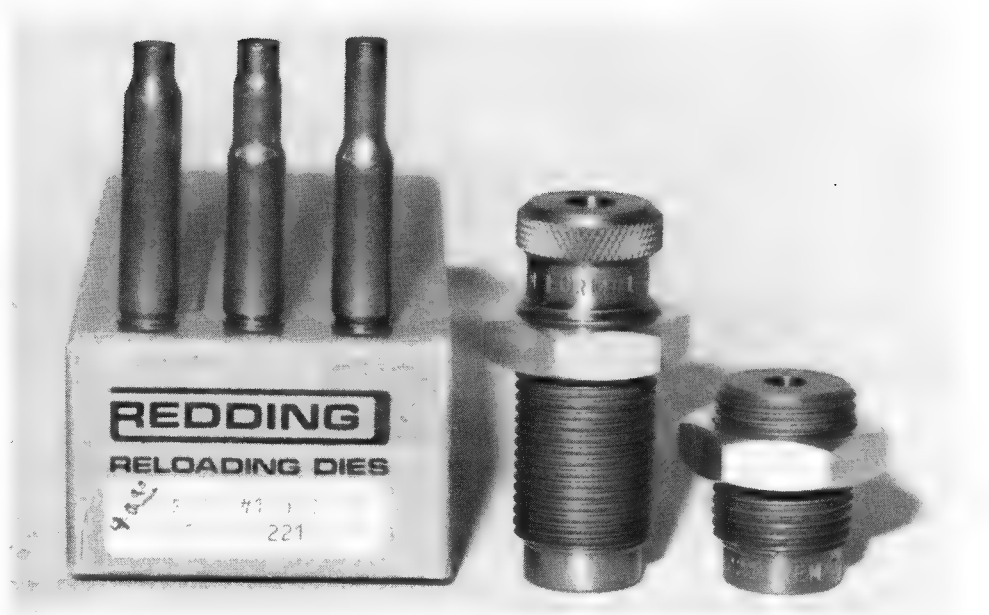
A small forming die booklet with complete instructions was enclosed and a RCBS Case Data Sheet for the 17 Mach IV. The sheet shows at a glance everything needed to form and load the 17 Mach IV. Information like maximum case length, case trim length, barrel twist, loading data case origin, case forming dies and complete case forming instructions just for the 17 Mach IV. Impressive!! They also enclosed an extended shell holder for the dies. One slight advantage these RCBS 17 Mach IV form dies have over the Redding 17 Mach IV form dies are both of the RCBS form dies use the same extended shell holder. No big deal but you don't have to change the shell holder between forming steps. My friends were right. RCBS has improved the quality of their dies and will back their products up. The RCBS 17 Mach IV form die set and the complete reloading die set are stock items at Midway 1-800-243-3220. I think it would be safe to say they also stock most of the RCBS product line which includes a lot of odd dies.

While we are on the subject of forming dies, I thought I would mention a neat set of form dies I recently traded for. This Redding form die set forms 223 Remington brass to 221 Remington Fireball. To try the set out I found some used 223 Remington brass that I wiped clean and lightly lubed with Imperial Sizing Die Wax. First, I ran the cases through #1 Form die which reduces the body of the 223 Remington case .060 and creates a new shoulder for the 221 Remington Fireball. Then I lightly relubed the cases and ran them through #2 Form die which changes the body of the 223 Remington into the case neck for the 221 Remington Fireball. This step reduces the body of the 223 Remington another .045 and finishes the shoulder for the .221 Remington Fireball.



Redding 223 Remington to 221 Remington Fireball form die set. Case at left is a 223 Remington and the next two cases are as they come out of the dies.

The formed case can now be cut in the #2 Form (trim) die with a fine hacksaw blade or trimmed down in a case trimmer. I tried my Forster case trimmer, and it took the neck down real fast without too much effort. A friend suggested that if I do use a hack saw blade on the trim die it would be wise to belt sand or lightly grind one side of the blade. This would remove the teeth on one side which would keep it from scratching the die. Although these trim dies are very hard and RCBS even warns in their form dies instructions booklet not to push a file down too hard as it can possibly ruin your file. But that doesn't mean the die can't be scratched up when cutting off or filing down the brass case.

My next step was to run these reformed 223 Remington cases which were now 221 Remington Fireball into my 17 Mach IV Form Die sets. Both the RCBS and Redding 17 Mach IV Form Dies turned the formed 221 Remington Fireball cases into 17 Mach IV cases with no problem. You could trim them at 221 Remington Fireball length or wait and trim them after you form them to 17 Mach IV.

My second favorite seventeen case would have to be the 17 Javelina, and I have tossed around the idea of sticking a new barrel chambered in one on my Shilen action. Although I remember reading about the cost of Javelina forming dies, and I just keep on shooting the 17 Mach IV. Then the thought occurred to me why couldn't I use these Redding 223 - 221 Form dies and my 17 Mach IV Form

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Cases formed from 223 Remington. The 17 Mach IV on left and the 17 Javelina on the right.

dies to make Javelina cases. So I put a fired Javelina case in the shell holder and lowered the press handle and screwed the #1 Form die (223 - 221) down until it made firm contact with the shoulder of the Javelina case. Then I removed the Javelina case and put a 223 Remington (or 222 Remington case if you prefer) case in and started the forming process for the Javelina brass. I did the same thing with the #2 Form (223 - 221) die and followed with my 17 Mach IV Form die set. After running the 223 Remington case through all four forming dies, I ended up with formed Javelina brass.

This is just another use for the versatile Redding 223 Remington to 221 Remington Fireball form die set. Depending on your needs, this set could be used to form almost anything on the 222 Remington family of cartridges whether it is the 221 Remington Fireball or any wildcat in between. All you really need to do is set the die in or out for your particular cartridge. A nice custom die set that should be available from most Redding dealers on a special order basis.

Last winter another little package arrived and this time it was from Midway, Columbia, Missouri. When I opened the box, I was a little surprised to find a hand held wind meter. Yes, you read it right, a wind meter. I thought what do I need a wind meter for and when would I ever use it? How silly, I thought. Inside was a nice letter from Larry W. Potterfield, President, Midway Arms, Inc. which said I might find use of a wind meter when load testing, so I would not have to guess the wind speed. To be quite honest, I really thought of all the neat things in Midway's catalog that would be fun to test and the guy sends me a wind meter! My curiosity got the best of me, so I took it out of its plastic case and started reading the instructions. Then I headed for our living room register and held it directly in front of it. Bingo, the little white ball went right to the top and peaked out at over 10 m.p.h. on the low side. I wondered how do I get it to read on the high side. It said to cover the top hole, which I did (the wrong one) but nothing happened so I called my daughter, Carley, up from the den to help me out. (Kids are amazing when it comes to figuring out things that embarrass adults, like plastic medicine bottles with child proof caps). Well, she grabbed it and read the back side, which also has complete instructions) and put her little finger on the round end that sticks slightly above the meter and placed it in front of the register again. Bingo, the little white ball dropped down partway and we read the high range side at 11 m.p.h. I could have figured this out, I told her (adults always do that too) and said thanks for her help.

This thing was really neat and seemed very accurate. The next day was cold but it seemed like a very steady breeze was blowing so out I went with my hand held wind meter. Facing the back directly into the wind, I got readings from 3 to almost 7 m.p.h. The steady winds are not as steady as I have thought. I have had it out quite a few times and what's interesting is that even a very slight breeze is actually 2 to over 4 m.p.h. If I would never use it again it has really made me aware of the variance of the wind and has helped me to estimate the wind speed when I don't have it.

Although this small 7" long unit has found a place in my shooting box. Instead of wondering how fast the wind is moving you may as well take a quick reading and know for sure. The wind meter is made by Dwyer Instruments, Inc. and is a quality product. We have used Dwyer Instruments at work for many years with excel-

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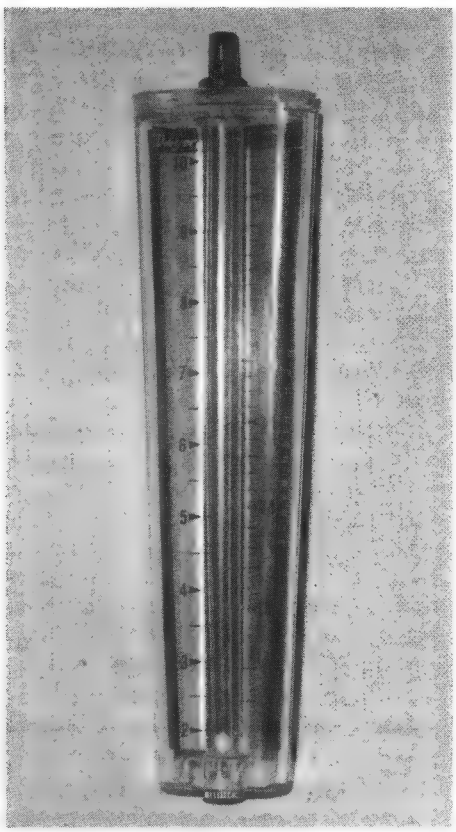
KINDLER

Continued

lent results. This compact wind meter is made of plastic and metal and only weighs a few ounces. On the left side is the low range scaled from 2 - 10 m.p.h. and the right side is the high range 7 to 66 m.p.h. As I mentioned earlier the high side (thanks to Carley) is activated after you place a finger over the small red tube on the top. The unit comes in a flexible plastic carrying case and includes complete instructions with cleaning materials. It is available for under $20.00 from Midway 1-800-243-3220. When you call, please tell the customer service representative that you would like to "Round-Up" your order. What's that you ask? Well, the folks at Midway will round your order off to the next higher dollar and the proceeds go directly to the National Rifle Association -Institute For Legislative Action. This little bit of "change" from all Midway's customers has raised almost $14,000 as of February 10, 1992. A special thanks from all NRA members to Larry W. Potterfield President Midway Arms, Inc. for this program and his personal donation of $1,000 each month!

This covers some new and older shooting products that are well designed and should last a long time with reasonable care. Oh before I close don't let Dave catch you cleaning your rifle without "them ole rubber gloves"!!!!!

(Editor: Many of our readers will miss Todd Kindler, who has abruptly (been) terminated, and will now be writing for Better Homes and Gardens).



Dwyer hand held wind meter.

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It has come to our attention that CBC 7.62mm x 51mm cartridges from lots dated 1975 may pose a serious safety risk. The specific cartridges in question bear the headstamp "CBC 7.62 75."

We hereby provide written notice to you that a potential hazard may exist with respect to outdated CBC 7.62mm x 51mm cartridges. There is a reported risk that such cartridges may cause excess pressure upon discharge and could result in serious bodily injury or damage.

Under no circumstances should these cartridges be used, given to anyone or sold.

There have been isolated reports of rifles bursting as a result of excessive pressure in what appear to be these outdated CBC cartridges. An independent testing lab reports that it detected a peak pressure that they estimated to be in excess of 130,000 CUP, in one out of a batch of 20 outdated CBC 7.62mm x 51mm cartridges dated 1975, that it tested.

CBC 7.62mm x 51mm cartridges are manufactured solely for military use in several nations around the world. CBC has not exported any of these cartridges to, nor sold any in the United States. These particular cartridges are not intended for civilian use under any circumstances.

In addition, a warning is issued for any CBC 7.62mm x 51mm cartridges from any year that bear a label on the packing material with the Spanish word "reengastada."

That label was not affixed by CBC, and its application to ammunition is not yet clear.

Anyone who has, or believes they have, CBC 7.62mm x 51mm cartridges from lots dated 1975, or CBC 7.62mm x 51mm cartridges from any year with the word "reengastada" on the packing label should immediately contact the dealer from whom they bought the rounds, and call the following toll-free phone number:

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Looking at Some Alternate Routes on the Yellow Brick Road; A Case of Not Leaving Well Enough Alone

by Richard Kayser

With the outstanding accuracy of my Miller Arms-built Schuetzen rifle an established fact, most people would settle for some serious (in my case a lot of) offhand practice and not mess with success. I had had a creditable showing at my initial foray into the esoteric world of breech-seated plainbase cast bullets in 1991. There was a mid-pack finish at the Tacoma, WA, regional and similar results at the Coors Nationals in Golden, CO, that August. That was followed-up with a stellar (for me) performance at Tacoma's fall Schuetzenfest where I steered 10 of those 1410fps lead missiles into a 1.38" group at 200yds that scored 246-6C and garnered a tie for first place in the scope-bench match. Two weeks later at Springfield, OR, I managed to wobble to a win into the stiff breezes during the scope-off-hand match. Normally a 186-1C is good for a handful of sympathy cards, but the winds blew hard and gusty. All in all, a rather nice rookie season. I expect, as I said earlier, anyone else would call it good and practice more.

However, Dean Miller had given me a rather sharply pointed spitzer design mold made by Ron Long "just in case you are the first person unable to make the Jerry Barnett design shoot". It is nice to know people have confidence in my abilities. I did get the casting rhythm down after a couple sessions, and the Barnett mold has proved to cast bullets less than .0005" (as close as I can measure) out of round. The Long mold sat on a shelf in my shop until mid-February when the cavity shape became too enticing to resist. About an hours' work casting alternately to minimize any differences gave me forty each of the the Barnett and Long bullets with a .2gr spread.

The Long bullet appears to be a much more streamlined design than the Barnett.

Surprisingly, the two come up less than half a grain apart in weight and the Long bullet is only .050" longer than the Barnett at 1.163" in length. The hope in testing was to find out how much difference in trajectory and accuracy the two might have. 40 rounds is not enough to draw a definite conclusion, but it would let me know quickly if any further experimentation was warranted or a waste of time and alloy.

We got a preview of Springtime the last week of February with a week of 65-70 degree sunny days. It came down to testing the Schuetzen bullets or chasing Rockchucks with the 223 Valkyrie and the 70-80gr JLK bullets and the Rockchucks won. Actually nearly a hundred of them lost, but that is another story. Mid-March rolled around before I made it back out to the range with the Miller rifle. We get some beautiful calm mornings during this time of year. We also get a few when the chronograph stands blow over as fast as they can be set upright. This was one of the calmer ones, the windgauge measuring 3-5mph during most of the test.

It would have been nice if either bullet had shown a significant accuracy advantage, but it was not to be. The two best 5-shot groups from each at 200yds could have been from either mold. The only big difference was in point of impact. Group centers were only 1/4" apart vertically, but there was a solid 2" left-right impact shift. The spitzers grouped about 2" right of the "pugnose" Barnett's. The lack of difference may be laid to the velocity, around 1410fps for either. That was a surprise. I had expected to see the spitzer carry better at 200yds because of its streamlined profile. One of these sunny windless mornings I may have to set up a second chronograph at 200 yds and see how much difference there is in terminal velocity. A little better wind performance would be very helpful in this game.

The 5-shot groups, while not an accurate barometer of Schuetzen match capability let me test a few theories. Bullet molds are just one of them. The sad news about the excellent groups I shot is my present inability to consistently put 10-shots into that 1 1/2" 25-ring at 200yds. Fortunately, no one else has done it either at a registered match. Hope springs eternal.

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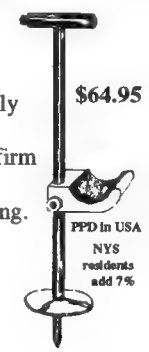

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Dr. Robert Fritz (L), HV 100 yd - 1st and Lee Andrews (R).

ELEY RIMFIRE AMMUNITION

John Gammuto

Eley Limited, a subsidiary of IMI, based in Witton, Birmingham, England, manufactures an array of discipline dedicated rimfire cartridges for target and sport shooting. In addition to the better known products, they also produce specialty items such as tracers, subsonic projectiles, shot-filled cartridges, and air gun pellets. Interest in these special application products caused me do a little investigation of my own. The following is the result of that effort.

Tenex, Eley's premium-grade target brand, was first introduced more than 25 years ago. Since that time, it has dominated international smallbore events. Evidence of this is the fact that it has been used to capture more medals and set new records than any other brand.

Eley's lesser known varieties and grades of ammunition are often dwarfed by Tenex and its reputation for superior performance. Shooters that expect the most from their equipment, and can afford to shoot the best, start out with Tenex and stay with it. Precisionists are seldom disappointed with Eley's top of the line offering. But other grades warrant your attention, especially now that Eley has ballistically enhanced several of their traditional "second level" brands, i.e., Match (Black Box), Club (Orange Box), and the high velocity offerings in solid and hollow points. Black Box has been significantly upgraded and is now called Match Xtra. The Club grade ammunition has also been brought to a higher performance level and been renamed Club Xtra. See

ELEY TARGET RIFLE CARTRIDGES

TENEX - The established leader. The cartridge with the most consistent performance at the Olympic Games, World Championships and major tournaments around the world. Approximate cost per box $5.95.

MATCH XTRA - Replaces the well established "Black Box". Noted for its high performance, especially at 50 meters, now has an extra-tight grouping specification. Approximate cost per box $3.60.

CLUB XTRA - Eley's club ammunition has always been a reasonably priced cartridge for all general club shooting events up to 50 meters. Ballistically similar to Tenex and Match Xtra. Approximate cost per box $2.65.

TARGET RIFLE - Recent addition to to Eley's range target cartridges, especially designed for up-and-coming shooters, economically priced. Approximate cost per box $2.50.

HV MOVING TARGET - Specially developed for competition use in the Moving Target discipline, for shooters that demand a high velocity cartridge. Approximate cost per box $3.25.

STANDARD - Recommended as an economically priced Long Rifle cartridge suitable for beginners, training and general club shooting, especially at the shorter ranges. Approximate cost per box $1.99.

LR SILHOUEX - Ample power for the exciting and growing sport of metallic Sillhouette Shooting at ranges up to 100 meters. Approximate cost per box $3.50.

LR Z - Specially designed for short range (12-15 meter) indoor competition. Characterized by low velocity, low noise level - now with a 40 grain bullet. Approximate cost per box $3.85.

JG/92

** FOR MORE INFORMATION CONTACT: TOMART DISTRIBUTORS, LAUREL, MD (301)953-3301*

Exhibit 2

ELEY SPORTING RIFLE CARTRIDGES

LR SCORPION HVS (Solid Bullet) - The potent combination of greater striking energy, flatter trajectory and high accuracy enables the Scorpion cartridge to achieve excellent field performance. Approximate cost per box $2.12.

LR SCORPION HVH - The hollow point bullet expands on impact and adds extra stopping power to Scorpion's accuracy and high velocity. Approximate cost per box 2.30.

LR SUBSONIC HOLLOW POINT - Your best choice when silence is of major importance. Approximate cost per box $3.85.

SHORT SOLID - Preferred in short chambered guns. Excellent for small game at short ranges. Approximate cost per box $4.25.

LR TRACER - A specialty cartridge that displays a long bright red trace for sighting-in, function checks, and military applications using sub-caliber devices. Approximate cost per box $Call.

LONG RIFLE SHOT - Effective for shooting mice, rats, etc. Loaded with No. 12 shot to eliminate damage to property. Approximate cost per box $call.

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Exhibit 3

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Eley Ammunition

BALLISTIC DATA FOR ELEY .22 TARGET AMMUNITION (NOMINAL)

RIFLE AMMUNITION	BULLET WEIGHT (GRAINS)	VELOCITY (FT./SEC.) MUZZLE	50 YDS	100 YDS	ENERGY (FT. LBS.) MUZZLE	50 YDS	100 YDS	MID-RANGE TRAJECTORY (INCHES) 50 YDS	100 YDS
.22 LR TENEX, MATCH XTRA, CLUB XTRA, TARGET RIFLE, STANDARD	40	1085	1006	941	105	90	79	1.1	4.5
.22 LR "Z"	40	800			57				

HV MOVING TARGET BALLISTICS ARE THE SAME AS LR SCORPION SOLID

BALLISTIC DATA FOR ELEY .22 SPORTING AMMUNITION (NOMINAL)

RIFLE AMMUNITION	BULLET WEIGHT (GRAINS)	VELOCITY (FT./SEC.) MUZZLE	50 YDS	100 YDS	ENERGY (FT. LBS.) MUZZLE	50 YDS	100 YDS	MID-RANGE TRAJECTORY (INCHES) 50 YDS	100 YDS
.22 LR SCORPION HVS	40	1312	1207	1100	153	129	107	0.8	2.9
22 LR SCORPION HVH	37.5	1312	1207	1100	143	121	100	0.8	3
.22 LR STANDARD	40	1085	1006	941	105	90	79	1.1	4.5
.22 LR SUBSONIC HP	37.5	1050	965	895				1.1	4.7

HVS - HIGH VELOCITY SOLID HVH - HIGH VELOCITY HOLLOW POINT JG:92

Exhibit 1

Exhibits 1, 2, and 3 for specific ballistic characteristics and product descriptions.

Eley has always been in the forefront of their industry and been known for their tight-toleranced manufacturing philosophy. For years, shooters believed there were only two types of rimfire ammunition, Tenex and "the others." Serious competitors, accustomed to winning, reached for the box with the familiar "Red Label." People that have been around the smallbore game for awhile will tell you, things haven't changed much.

Eley has traditionally maintained their edge over competitors by developing and investing in high tech systems that insure self regulated quality standards. RWS and Lapua, Eley's only real competitors, have in recent years made advances in their match grade products, but are still finding it difficult to overcome Eley's reputation for excellence.

Closer to home, only a privileged few know anything about this country's most comprehensive rimfire cartridge development project. It is very hush-hush. I'm of course referring to Federal Cartridge Corporation's efforts to produce world class .22 rimfire ammunition. Federal hopes to match or exceed the true-flight characteristics of Eley's Tenex and the noncommercial variety used by the Soviet Union's Olympic Shooting Team.

The only thing we can do for now is continue to shoot Eley products and hope that Federal Cartridge Corporation is successful in their endeavors. Everything I have heard about the project leads me to believe it is being well managed. The Olympic Games in Barcelona will certainly be a measure of their success.

If you would like more specific information about the availability of Eley products in this country I suggest you contact Dick Sutor at Tomart Distributors, Inc., 122 LaFayette Ave., Laurel, MD 20810, (301) 953-3301. The approximate price per box quoted in Exhibits 2 and 3 are based on case lots (100 boxes) only. The firm does not sell single boxes of ammunition.

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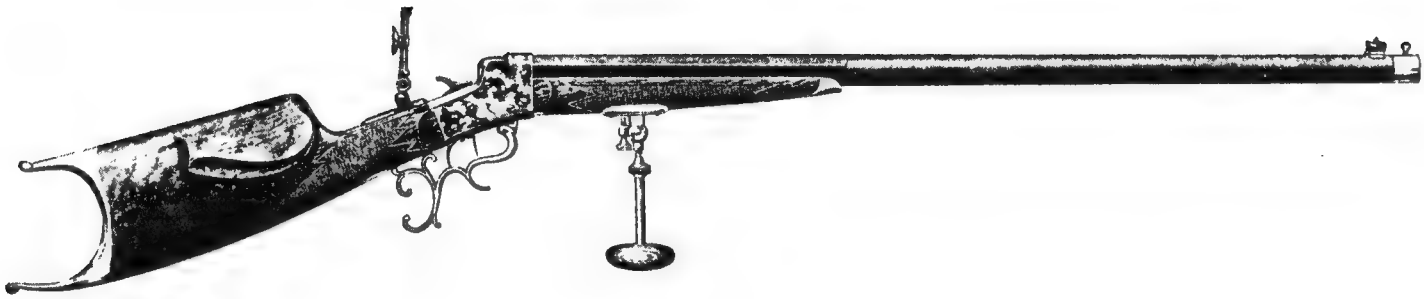


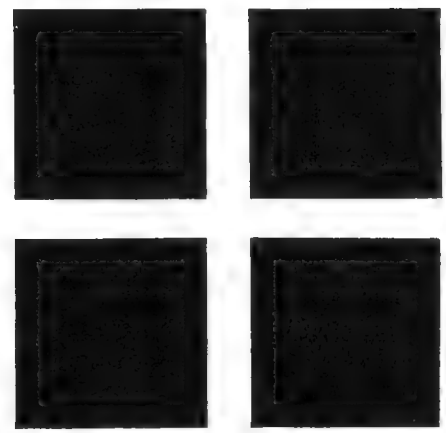
DENNIS HRUSOSKY

It is with some degree of reluctance that I submit this group for publication. In 1976, when I fired this group (at least I won't be accused of rushing it in to print!), I thought it very probable that I was at that time the only shooter on this planet to have accomplished a 10 shot (plain-base) lead bullet, 200 yd. group under 3/4". Can this still hold true today?

Given the marked growth in lead bullet accuracy and technology over the past decade, I am no longer sure just what the current "state of the art" as to lead bullet groups may be. Perhaps exposure of this group will bring forth other's efforts that I'm unaware of.

Although my group (independently measured @ .734) missed beating the famed "Rowland" group of 1901 (meas. @ .725) by .009, it is still, to this date, the only group that made my shop wall "framed under glass".

Background: Through the 1970's, I spent much of my time, energy and money at my avocation of rest shooting with single shot rifles and cast lead bullets, with the very real asset of having my



10 SHOTS at 200 YARDS
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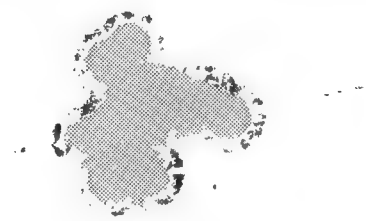
Siegrist / Rem.-Hepburn



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own range nearby. My range being best described as a narrow "slot" cut through a mature timber lot, oriented S.S.E. ... on any day with moderate wind and good light, it is as close as one can get to a "laboratory" condition and still be outdoors!

Rifle and load data: The rifle employed was an original Rem.-Hepburn single shot with double set triggers, fitted with a new "soft" steel barrel, 30" long, rifled by A. Siegrist in caliber .40-55 S.S. and fitted by B. W. Darr. 8 groove rifling; .030 wide lands, 1 in 18" twist, groove 0 = .405, rifle (scoped) weighing just under 15 lbs.

The bullet was Lyman #40392, 320 grains cast 1:25, sized to .405, breech-seated 1/16", "Manny" lube, charge was 20.9 grains of Dupont #4227, Rem. 2 1/2 large pistol primer.

Conditions that day were noted as temp. 70°, no measurable wind, solid overcast (but "bright"). The scope used was a Lyman "Jr." Targetspot in 10X power. Yes, that is correct. My eyesight was such in those years I couldn't understand why anyone required higher power scopes. Now, some 15 years later, it seems to me there are no optics made today that are "adequate enough"!

This same rifle set the first ASSRA 200 yard group record at Beeson's Range in Indiana (5 shots at 200 yards in .505") (see Precision Shooting, Dec. 1974, Page 8). It has also shot several 5 shot groups in the .4's on my home range and a few 10 shot groups that were better for 9 shots, but I never did achieve another where all 10 went under that 3/4" barrier.

Perhaps the foregoing will elicit a reply from anyone else who "got there"?

Dennis Hrusosky
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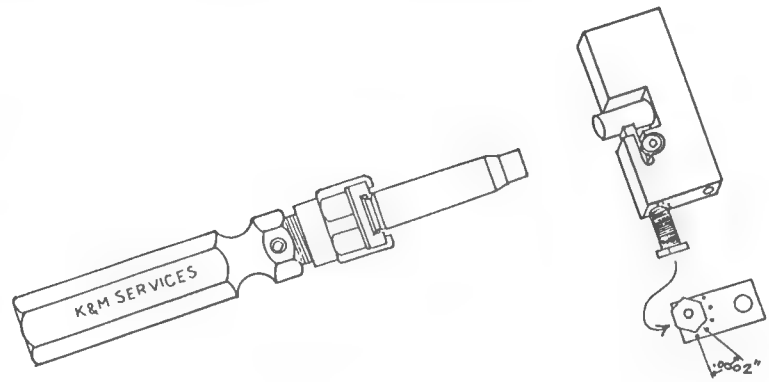


Use a sparkplug feeler gage to make initial cutter settings on your turning tool. Helps a lot!

K+M STRAIGHTLINE PRIMING DEVICE - Set up depth of primer seating by rotating shell holder until primer will touch bottom of pocket BEFORE the handle touches the tool body. DO NOT seat primers all to same depth by shell holder adjustment lest erratic ignition result. Seating by feel is the ONLY WAY. Lee AutoPrime shell holders may be used without alteration. Shell holders are changed after partially unscrewing (long threads) the head assembly to reduce tension and the SH are popped in and out.

REDDING POWDER MEASURE - The directions should be studied with reference to using the Redding BR-3. In addition; When you de-grease this measure take it apart and keep your de-greasing fluid away from the paint. the hopper and the plastic drop tube. All will be damaged by most degreasers. Use sparingly on a cloth and/or Q-tip, don't slosh it in. Second screw to dismantle on the right hand side is UNDER the first screw in same hole.

I prefer to degrease with Gun Scrubber or carburetor cleaner. Powder has graphite in it and constantly lubes the measure so no lubrication is ever needed. Never return the measure setting all the way to zero. Once it has been used minute specks of powder remain in the mechanism and to return to zero would shift it's calibration.

Whether you give the handle one, two or three raps at each end of it's travel makes little difference. THE OBJECT IS TO DO IT the same every time to get uniformly measured charges. Charges that don't feel right should be dumped in a jar for transfer back to the powder bottle when finished. Do not use settings recommended by other shooters. Any mechanical instrument can have it's own calibration and measures will vary one to another making the above practice unsafe.

Once you develop your own calibration for a powder or load you can go back to it with 100% confidence of getting the same load as before. The only exception would be when powder has taken on or given off moisture in storage. You may vary loads safely without a scale once you have determined the increase or decrease in powder charge per increment on the measure for a given powder. Treat your measure like the precision instrument it is and it will give you a lifetime of service.

PILL BOTTLE ADAPTER - This convenient dual funnel lets you put powder into a measure and remove it from the measure without exposure to wind, weather or need for a funnel. The one for either Redding measure is designed to drop in and be locked with the two set screws after the original hopper is removed. It is best to put a pill bottle on it and square up before tightening. This measure can then be switched back to original if desired.

RCBS and B+M require epoxy to hold the baffle in. The baffle is designed to accept Eli Lily Darvon or Darvocet N- 100 pill bottles available for the asking from your local pharmacist. Many other similar sizes and shapes of bottles also fit and usually one request to a drug store will result in near a bushel of empty bottles to choose from. Use an "O" ring at the juncture of pill bottle and baffle if loading right out in a rain.

THE EXPANDIRON TOOL - should be pretty much self explanatory. Adjust the screw in the end of the expanding plug so that it will hit the web of the case BEFORE the case mouth can hit the body of the die. This prevents collapse of the shoulder and neck. A very slight amount of lube will let the expander work better. On expanding up .220 Russian cases it is often better to go over the .224" plug first and then go over the .243" plug for best ironing and expandings. In most normal brass, cases come off very close to the perfect size for going on the Marquart case turner pilot. To change expander plugs loosen the hex screw on top of the die. Any standard die ring can be used and the die will fit in any standard press.

The DEPTH CHECKER - seems to be a mis-understood tool to use. It attaches to the left segment of your 4" or 6" dial caliper and can usually be locked so that the caliper reads exactly 1.000" for ease of recording and subtraction. In use a loaded round is read and the reading noted. Assuming a round with a seating depth that shot well, the object now will be to load other rounds with other bullets to achieve this EXACT same ogive reading. This puts the second bullet in the same relation to the lands as the first. It can also be used for checking differences in lots of bullets especially those of regular manufacturers. Sorting bullets will often let you segregate them into lots that will shoot better after sorting.

OUR .22 RIMFIRE gage - this unique tool is designed to let you sort .22 rimfire cartridges into groups that will shoot better as individual lots than they would as a whole.. Each cartridge should be placed in the recess in the same manner; with the trade marking the same way for every one. The bar should be slid GENTLY until a reading is achieved. An adjustable chamber has been added. As shipped it is set for American ammo as well as Eley, RWS and most readily available ammo. It is best not to loosen the set screw or turn the chamber. If you do you will lose SAMMI headspace calibration and re-calibration would be required by someone with a .22 RF headspace gage. Careful sorting will enable Remington .22 Target to shoot like match ammo and Eley Club will shoot as well as the higher priced Eley 10 X. (Of course 10X will shoot even better too!)

GROUP MEASURING DEVICE - this device is intended for addition to a set of 4" or 6" dial calipers of accurate quality. The target spiking unit is attached by set screws and can be removed to permit other uses of the caliper. The plexiglas plate should be attached to the caliper using the set screws. It is located above the dial so as not to interfere with the thumb drive screw of the caliper.

Do not attempt to shorten the plexiglas plate for to do so would destroy accuracy. A binocular headband type magnifier is an absolute necessity for operation and some operators have good success with large table mounted magnifiers to work under. Small magnifiers attached to the calipers usually cause distortion and are not recommended.

Procedure - Examine the target and if possible estimate the direction of the widest spaced shots. Make certain the caliper is set at dead zero and place the correct caliber size hole over the bullet hole or segment of bullet hole on the left. The scribed holes are .224", .243", and .308". The next larger size works well for the limited needs of .277" and .284". I've had good luck using the 6mm or .243" circle on .257" and even on .264". Once the correct circle is located over the bullet hole on the left the scribed line is positioned to bisect the center of the bullet hole you are going to. At this point the target is spiked by the caliper to the work surface and the caliper is adjusted until that SAME CIRCLE correctly surrounds the farthest bullet hole to the right. The reading in thousandths of an inch is taken and recorded.

If a group is round or square several measurements are taken and the largest is recorded. I have found that it helps to use a large piece of heavy cardboard underneath the target for spiking though smooth plywood also works well. When measuring for a match it is best to have an assistant gage the longest dimension of a group. As with any instrument, practice and familiarity will produce speed. What may seem like an eternity to measure a target will dissolve into seconds after you've done a few hundred. ONE PERSON only should measure ALL targets in a given match.

The PA Sizing die should be degreased on the inside and bushing inserted with the chamfered mouth DOWN. It should float freely inside the die body. Body should be adjusted in press so that bushing just touches an empty case. Then the upper part of the die should be screwed down exactly 3/16" and locked which will result in sizing 3/16" of the neck. If you need to size more of the neck to hold the bullet for a magazine rifle ***DO IT CAREFULLY.*** You MUST NOT hit or distort the shoulder of the case....***IT IS DANGEROUS.***

JONES DECAPPING TOOL - Adjustment may be made for correct length of stroke and alignment by loosening the screw on the anvil and moving anvil to correct position. This must also be done when reversing the anvil for opposite calibers. Mandrels may be changed by screwing off the tool and replacing with one of choice.

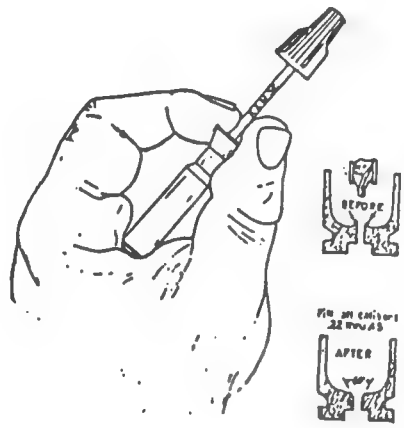
Caution: Be certain that knockout pin has entered the flash hole in cartridge case before attempting to extract primer. If this is not done excessive pressure will bend the pin or mandrel. When set up correctly the head of the case cannot drop into shell holder head unless the pin is IN the flash hole. While case drops lower than center with PPC cases in .308 head, allowance has been made and decapping is easy.

The OWL EAR front bags can be conformed to the forend by placing the rifle on the rest and tapping the ears alternately with a plastic mallet. Ears will shape to contour of forend.

Don't leave any of the new, modern **BORE CLEANERS** in any barrel longer than 15 minutes. All their strength is gone after that period anyway and they offer no preservative benefits. Cases of etching and/or rusting have occurred. Be warned!

The K+M flash hole UNIFORMER is quick and easy to use. Best results come when you work with a new case. The patented K+M safety design with control the depth of inside chamfer. Usually one or two turns BY HAND will be sufficient to cut off the inside manhole lid and uniform the flash hole. The Unique mouth plug aligns the Uniformer. Use your fingers. NO POWER is needed and you can feel it cut off the roughness.

Note on above: Jim Stekl of Remington tells me exhaustive tests indicate that in PPC and BR there is a definite advantage for the small rifle primers but absolutely no advantage derived from leaving the European flash holes smaller than standard. Many top shooters ream with an .078" wire gage drill for total uniformity.



CUTTING AN EJECTOR SPRING - One of the quickest solutions to better concentricity and accuracy in a Remington 700/40X type rifle is to relieve the ejector spring to decrease the forward plunger force that pushes the cartridge crooked in the chamber. With the bolt removed from the rifle, drive out the crosspin near the front locking lugs that holds the ejector mechanism in. DO NOT remove the punch....put the face of the bolt against your workbench first and then withdraw the punch to avoid flying parts.

Remove both the ejector and it's spring from the recess and cut off seven coils of the spring. Re- assemble and the ejector should just tip the case for finger removal of the empty without throwing it on the ground and much less force against the cartridge will be better for case and bullet alignment with the bore. For hunting season a new ejector spring can be purchased for a dollar.

Call for help if you get stuck. This can be a somewhat complicated game we play!

Bob Pease Accuracy

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Coors Schuetzenfest XI: The Tacoma Regional

The changing of the guard occurred at 4 p.m. PST, Sunday May 3rd. After four consecutive wins at Tacoma Rifle and Revolver Club's Coors Regional, Dave Purcell had to surrender the top spot to Jim Eckard. Better known as (perhaps) the top muzzleloading competitor in the Pacific Northwest and a member of the United States squad in the International Muzzleloading Assn., Jim brought a brand-new (unfired!) Miller rifle in 32-40 to the match. By the time it had 100 rounds through it, Jim was close enough to the win that most of the competitors had thrown in the towel. By the time his stunning 496-16C Scope Bench score was announced, the range had begun to resemble a laundry room.

Dave Purcell stayed close all weekend, despite some minor equipment problems. His attention may have wandered, since he is a probation officer in California and is looking forward (?) to receiving some of the overflow from the LA riots. The other excuse he asked me to pass along (let's see, he finished in 2nd Place by **4** points. The riot is worth two, so this one is also a 2-pointer) was RE Duane Jenner, Dave's shooting partner, Duane couldn't make it so Dave had to bring his wife instead. While **much** better looking, she is not quite the spotter/coach Duane is. Sounds good to me Dave.

Miller actioned rifles dominated the win column again, and Ron Smith's gain twist barrels are beginning to show up in the equipment lists regularly. I saw the name Jones under "mold maker" a couple of times at Coors last summer, and one was the high score of the match. They are a spitzer design with a long baseband. Those two features seem to go hand-in-hand, as the Jones design seems to be shooting well. In fact, a Jones was Jim Eckard's choice.

By the numbers on Saturday and Sunday. Lowell Hamilton (no surprise) won the Iron Sight benchrest match with a screamer, 489-10 centers. Lonnie Bathke drove up from California and took the Offhand Iron match with a solid 409.

The Tacoma range sets nestled in a pocket of old growth timber, and has had superb conditions. Most competitors feel the first 250 will come from Tacoma, and Jim Eckard was 1/4" away from that feat Sunday morning clustering 9 shots under an inch on his second target. His last shot fired over-held left just outside the 25-ring, but the 20 shots fired for record scored a superb 494 with 16 centers for the win. Barrelmaker Ron Smith led the Canadian Contingent down to compete, and led all scorers in the Scope Offhand with a 448-2 centers. Ron builds (I think) a 20 1/2" to 14" gain twist cut-rifled barrel in .32. When the target crew gathered the last targets from the scoring shack, Jim Eckard had taken a brand new rifle to a narrow 4-point win, 1794-21C to 1790-19C, over 4-time winner Dave Purcell. Gerald Miller finished a solid third with a 1779, and Tommy Mason came in fourth with a 1773 and an excellent 21-center count.

Jim shot the rifle minus a forend, resting the round barrel on the front rest with no load development. It will be interesting to see if he does any "tinkering" between now and the Nationals.

Another changing of the guard occurred at Christmas. Coors assigned the Schuetzenfest program to Pam Krider. I spoke with her at Tacoma on Sunday, and she is busy learning the Schuetzen game. I think she will be a very competent liaison person, and work well with the sponsors and shooters.

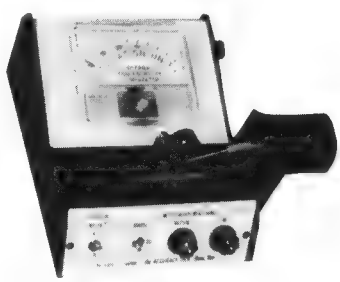
The Canadians won that "What's that?" award with an innovative Rube Goldberg windflag design. It has a cylinder that spins with numbers from 1-10 on it. The outer housing is fixed, and has a slot cutout 1 number wide. See Photo. I am going to build a couple and see if they help.

Another mild upset rumbled through Tacoma, Adeline Hamilton did **not** with the Ladies' Match. JoAnn Maddox did, 246-6C to Adeline's 245-5C, and she accomplished that feat with one of Paul Shuttleworth's new almost-a-Stevens-Pope 44 1/2 replica in 32-40. Paul has had some delays in getting everything set-up for production, but did begin shipping rifles around Christmas. Three of them now reside near Eugene, Oregon, owned by members of the Cast Bullet Association Club there.

JoAnn and husband Monte Maddox both competed with the CPA (Shuttleworth's Company) 44 1/2 at the regional. Casehardened beautifully, and copied from an original Pope-Stevens, this rifle is everything a "traditional" shooter could ask for. Again, I want one.

The youth match was another "squeaker", Charlie Crane nosing out Steve Stratton 233 to 232. The Tacoma club emphasizes junior shooting, and Jim Eckard is one of their success stories. Youth matches are a big part of the Coors

Continued on page 68



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Jim Eckard, 1992 Coors Tacoma Regional Champion and winner of the KingMatch. 1 shot offhand at 200 yds. His bullet struck the 1/2" bull at 12 o'clock.

Pam Krider, Coors' new Schuetzenfest coordinator.

The oldest shooter at Tacoma, NBRSA record holder Manley Oakley is combating mid-life crisis by taking up Schuetzen shooting.

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COORS SCHUETZENFEST XI

Continued

Schuetzenfest program, which is as it should be. These young people are the future of shooting in this country. We need to reach as many of them as possible.

The only downside to the Tacoma Regional was my shooting...or lack of it. I spent a lot of time practicing this past winter; both at casting good bullets, and at my offhand shooting. The Tacoma Club hosted a one-day warmup two weeks before Coors, and I had been good enough **for one day** to win the offhand scope match against some good shooters. I had harbored some hopes for a couple top-five scores, but that was not to be.

I have the unpleasant experience of a torn rotator cuff in my right shoulder. By the time you see this in print, the surgery will have been performed, and I will be halfway through the six week no-shooting part of the rehab process.

Tears (and the resultant surgery) can be up to a six-month's long vacation from shooting, but this one is small and we found it right away. With any luck, the tail end of Rockchuck season is salvageable. Ditto for the Coors Nationals.

Take care,

Rich Kayser

P.S. I shot the Media Match left-handed and managed a 242-3C. Just good enough to win again.

Conrad Grims and Steve Meacham plotting strategy.

JoAnn Maddox (R) with the Ladies Match prize, a hand-cross stitched "Oceanlife" tapestry.

Spotting Scope Rangefinder Update

I **expect** we will have the rangefinder within twelve months. It will (probably) be in a packaged spotting scope/rangefinder arrangement. I cannot give you any more information now about price, etc. **But**, you will like it.

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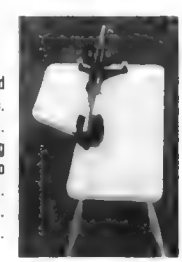

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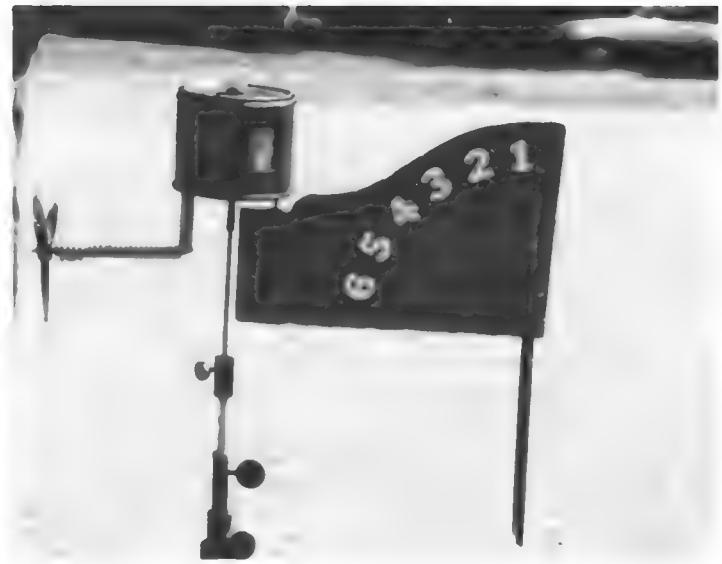
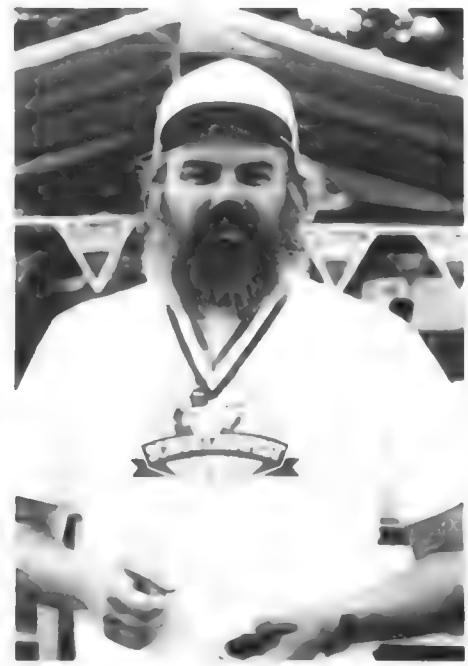
Youth Match shooters Steve Stratton and Charlie Crane.



The Ultimate windflag, Canadian-style. It shows relative windspeed (1-6) and direction (1-10_ on a scale.

Dave Purcell (Silver), Jim Eckard (Gold), and Gerald Miller (Bronze) top the best at Tacoma.



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COMMENTS ON BARREL BREAK-IN AND ACCURACY

I've been reading the responses of various readers to John Gammuto's lubricated barrel break-in procedure. Enough of my sitting here, squirming in my chair, as I read the input; it's time for me to put my two cents worth in here. (Editor: by way of introduction... Veral Smith is a well-known, well regarded maker of bullet molds). I have three main reasons for cranking up the office typewriter (cranks are still used to start some of the older typewriters here in rural Idaho):

1.) My lap kit was mentioned as perhaps a solution to bore fouling.

2.) I've been a machine rebuilder/hand-scraper/repairman/machinist/tool steel welder/and heat treater for 30 years now... which has taught me a bit about precision tolerances, bearings, and metals.

3.) I've been making custom bullet molds for a few years, and I do all that I can to send slugs of their guns' throats and bores before I cut their mold. As a result, I've measured thousands of guns where it counts most, and I get feedback from customers about their results. Today I can just about predict the accuracy potential of a gun without ever actually seeing the gun. Some I **know** are good jacketed bullet or cast bullet shooters by looking at slugs, others will not handle jacketed bullets well because they have too large a bore... but with properly fitted cast bullets will perform along side anything in its class... be it a comparison of lever, bolt, light barrel guns, whatever.

After reading Precision Shooting for some time now I sense a glaring lack of attention, or information, on throating... and the importance of the barrel and bullet diameter relationship. To say it all in one line... **THE BEST BULLETS IN THE WORLD WON'T SHOOT ACCURATELY IF THE RIFLE'S THROAT LETS THEM TIP ON TAKEOFF, AND ESPECIALLY IF THE GROOVE DIAMETER ISN'T A TIGHT FIT FOR THE BULLET.** If my writing seems to ramble about a bit, bear in mind that everything I write about here is about these factors, and showing you how to know more about them. Careful loading procedures are important, of course... but of little value if the gun is not right internally.

Everyone should make a slug for any gun that the owner looks to for serious accuracy. I almost demand it before I'll cut a mold, because with lead bullets... **FIT IS EVERYTHING**. Yet, knowing a gun's throat is almost as important for the shooter of jacketed bullets. Rest assured that it is **VERY** unlikely that your gun is cut to SAMI specs for the cartridge, and if it was so cut when new, wear changes it, and knowing the effect of the wear will make one a more knowledgeable (and better) shooter of that gun.

LBI supplies lead slugs for making these throat slugs, or anyone with a lathe can turn them out quickly. The slug should be smooth, and small enough to fall freely down the barrel. To make a slug... fill a fired case with hard lead, or stand a piece of steel rod inside the case, which stands about 1/16" short of the end of the case. Chamber the case, lube the lead slug with Break Free or other slick lubricant, and drop it (from the muzzle) down on the chambered case. With a piece of cold rolled steel (cold rolled steel is much softer than any quality barrel, and will not mar... short of your making a ghastly botch of things)... the largest diameter that will fit down the barrel freely... and which is cut about two inches longer than needed to reach the slug... now swage the slug tight enough that the action opens with a bit of effort. Gentle blows with a large hammer seem to work best. Now open the action and tap the expanded slug out. I bet that you will be surprised at what the throat actually looks like... compared to what you thought it looked like!

To check bores dimensionally, end to end, drive a lead bullet or slug into the muzzle, and pull it. Then compare the diameter of the grooves at the throat and at the muzzle. A third, and very enlightening slugging trick that I try on all guns that I intend to shoot much is to push a snug, pure lead slug through the barrel's full length, by hand. This one has shocked every gun owner which I've had try it. Normally their face turns a pasty shade of white when the slug hangs up part way through; and whatever their choice of words right about at this point... it's always interesting!

Fire lapping cures all those barrel inconsistencies, for cast bullets... but may well not be indicated for jacketed bullets... because we should never open the barrel's groove diameter larger than the bullets that we will be shooting.

The bore's internal dimensions will vary for several reasons. Any kind of external machining will show up, or alter the inside, as will tension from screws, the barrel's shank into the action (if it covers more than the chamber), tapering, fluting, cutting flats... all these distort the barrel internally, as does stamping, especially if the barrel was not well stress relieved during its manufacture.

All of the above are defects not attributable to boring or rifling, while a whole host of (different) variables effect the consistency of the boring and rifling process. Again, there isn't much, other than wear, that cannot be corrected by lapping, if the bullets subsequently used are properly fitted to the lapped barrel.

After measuring slugs from thousands of rifles, and reading reams of customer's

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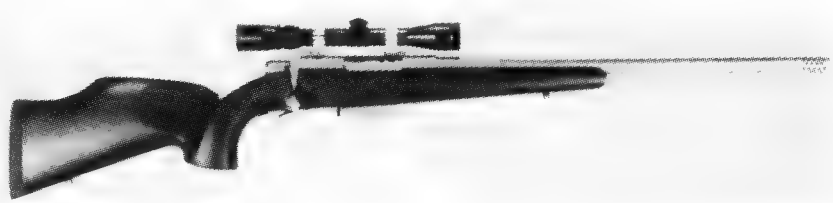

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comments about the rifles, or single shot handguns, I have reached the conclusion that the best throat form, bar none, is a straight cylinder with gentle leade into the rifling. If we are dealing with a rifle for jacketed bullets only, the ideal throat diameter would be .0005" larger than nominal bullet diameter. If we are dealing with a cast bullet rifle I would recommend .001" over whatever the actual groove diameter happens to be, with bullets fitted (sized) halfway between groove and throat diameter. My reasoning runs thus ... if the throat is close to bullet diameter, the bullet cannot tip on takeoff, and if it starts straight, then the bore has an easier task of keeping it so. On the flip side of the coin, if it doesn't start straight, there is **NOTHING** a good barrel, or a great barrel, can do to straighten it out.

Quite often a customer will say something like "This rifle is super accurate with jacketed bullets, so I don't want to modify anything." If memory serves me correctly, **EVERY ONE OF THOSE SUPER ACCURATE FACTORY RIFLES HAS BEEN A REMINGTON, OR A RARE SAKO**... or a custom barrel with a throat such as I've described above. Further, they all have throats such as I've described, and their groove diameter is tight for nominal size jacketed bullets. Also of great interest, every Remington rifle barrel which I've measured, via slugging at both ends, is tighter at the muzzle... which of course is mandatory for hammer rifled barrels, or else the mandrel could not be removed.

I feel strongly that a tapered throat, which is common to many chambering reamers with integral throating sections, will degrade and possibly ruin guilt edge accuracy of a premium barrel, thus negating the purchaser's reason for upgrading the barrel!

From personal experience, coupled with a very large number of customer's statements... the very worst performers are barrels with muzzle diameters more than .0005" larger than at the throat, with some going up to .002" larger up front. Another fairly ghastly combo is a rifle whose groove diameter is considerably larger than the bullet's diameter, and especially in conjunction with a large, tapered throat. Throats out of concentricity with the rifle's bore is another fairly common problem that also does nothing to help accuracy. (This condition shows up on a throat slug... the rifling comes back in the throat further on one side).

I don't believe that a slightly rough bore finish has a negative effect on accuracy if its diameter is quite uniform from end to end; this holds true with jacketed bullets at any velocity, or with gas checked lead bullets if the velocity and pressure are kept low, so that the bullet isn't ground undersize, or the rifling engagement stripped. However bore roughness is quite certainly a contributor to jacket fouling, which brings me to my incentive for writing this little piece on barrel breakin and bore lapping.

My name was mentioned, in an earlier PS article on the subject by Nick Wynne, who wondered why I call my **LBT** lap "fire lap". Answer: I'm not a good name inventor... the lapping process is done by firing the gun... so it's fire lapping. I've sold somewhere around 2,500 of these lap kits to bullet mold customers, and have received only two negative reports. One customer split a revolver barrel by shooting with a stuck bullet in the bore, and another complained of poorer accuracy after lapping, with the same cast bullet and diameter as used prior to lapping. (He should have fitted a larger bullet to his enlarged barrel). All other reports have been at least "good", most are thrilled with the results. I should add that all of these customers are lapping for cast bullet use, and most are working with handgun barrels, to smooth the rough broach rifling, and are removing as much as .003" choke that is created when the barrels are torqued into the gun's frame.

When my customers set up their revolvers just like I've described for the ideal rifle throat, they suddenly find themselves with rifle like accuracy. Many get an inch grouping, or less, at 100 yards, down a bit from their previous two and three inch grouping... at 25 yards. If the bullet is heavy, and of **LBT** design, be safe in guaranteeing two inches at 100 yards from any revolver with cylinder throats not more than .002 larger than groove size, if cast bullets are sized to slip through the cylinder throat snugly, and the barrel fire lapped straight and smooth. Rifles of course do not have "six throats in a wheel", and do much better. Of course if either type gun already has a huge throat, and we have to fit .002 to .004 larger than groove size to prevent bullet tipping in the throat, to obtain the best accuracy from the gun, then best results will be less exciting, because bullet deformation unbalances the bullet's weight in relation to the bore's centerline.

As to the often asked question of whether neck turning is beneficial or not, it seems to me that if the throat holds and guides the bullet properly, and the bullets are seated out of the case far enough so that the throat has control of the bullet, the case becomes just a powder can and a bullet inserter... as long as the bullets are not seated so far out of concentric as to bind the bullets in the throat. (If the throat is sloppy, then the case can be worked on until it balances the bullet somewhat concentricly, and partly offset the problems coming from the bad throat).

Continued on page 73

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TRADING POST

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HAVE 75 OF THE "OLD", ORIGINAL, SAKO, 220 RUSSIAN CASES, ALL UNFIRED. Offers solicited for all or part. Herb Aitken, 532 Summit Ave., Eau Claire, Wisc. 54701.

Shilen H.V., new Hart bbl., Hutcherson paint, Hutcherson metal, 6PPC, Shilen trigger, 20 new 220 Russian cases, $1,250. B&L scope $250. 318-868-8738.

8 lb. Caddy IMR 4227 $70. 15,000 Federal 210M primers - $70. per 5,000. (316) 688-0969.

FOR SALE: 6mm PPC, built by Masker. 20" Clyde Hart barrel (ss). Wichita WBR 1375 action. McMillan fiberglass stock. Canjar 2 oz. trigger. 36X Leupold scope with 1/8 min. dot. 1350 rounds. Bore guide. Dies. Makes light varmint. Price: $900. Ed Wilson, PO Box 350, Aquebogue, NY 11931. (516) 722-4420 after 6 pm.

PAS ALV sporter, 6 BR .100 short, rb, rp, Schneider 1:14 barrel, R&M Precision stock, extra bolt. $975.00. 319-689-6258.

Cooper actions with rings. BR and 222 bolt face. Never barreled. $600 each or $1,100 both. Joe M. Dailey, (701) 839-6275.

Bausch and Lomb target scope, 36 power, fine crosshair, $279.00 or reasonable offer. (508) 588-5517.

WANTED: Used Leupold 24X, prefer BR. Leu./Siebert 30X. Used barrels from Mod. 37 Remington 40X rimfire action. Will trade new Sako 220 Russian cases on 37 Remington barrels. Selby Wright 812-944-1920.

1000 yrd. Rifles: .30-378 long version, Six unlimited stock, Hall .30-378 w/muzzle brake, glass stock. Spacemasters 20X 77mm Rem. 40X .284 Baer, Six unlimited stock. Unertl scopes etc. Joe (215) 729-0521 9:00 - 5:00 pm (EST).

6PPC three class benchrest rifle, Stolle Panda action, McMillan fiberglass stock with weight system, Lilja stainless barrel, Hart 2 oz. trigger, smithed by Sinclair, $1395. Original Ferguson Unlimited Rail Gun, choice of 222 or 6x47 cal. w/Hart #4 action, Hart 1.350 bbl., Hart 2 oz. trigger, Ferguson front and rear rests w/sighter cam and indicator windage adjustment. As close to new as you will ever find (250 rounds) $1695. Rem XP-100 used action, 308 boltface, Exc. $225. Rem XP-100 bolt w/308 face, 700 bolt handle $115. Varmint rifle 17 PPC cal., XP-100 action, 26" Pence SS bbl., Fajen laminated stock, Shilen 2 oz. trigger, needs glassbedding $625 w/cases. Leupold 6.5 to 20X Exc. $299.95 Leupold 36X crosshair Exc. $325. Detsch 6mm and 22 carbide bullet swage die sets for miniboattails, less than 2000 bullets made, as new $1195 ea. set. Pindell 22 cal bullet swage set up, includes all necessary items, press, core cutter etc. close to new condition $595. Biehler/Astles 30 cal bullet swage die set, less than 1500 bullets made $425. Bahler Die Shop 6.5mm bullet swage die set, VG $149. RCBS A-2 bullet swaging press, modified by Detsch, w/ejector frame and punch holder, Exc $295. Bob 201-663-5159.

6PPC L.V. weight system, Stolle Panda, McMillan glue in three barrels. 260 NK Kenyan 2 oz. trigger, 50 rds. Russian Brass, B&L 36X. Ready to go. $1875.00. G. Ferguson, 3828 Ravenna Ave., Louisville, OH 44641.

FOR SALE: 7mm S.T.W. Rem 700 action Hart #4 contour bbl. with Jarrett muzzle brake McMillan sporter stock Leupold 4x12 power scope Redfield base and rings 200 to 300 rounds brass smithed by Kenny Jarrett stocked by McMillan $1,200 with scope $1,000.00 without scope. Call Days: (309) 797-5441, Eves: (309) 788-1527, ask for Bob.

FOR SALE: 1 Sherer barrel, 6mm 1 turn and 14" twist. Barrel is new, never threaded or chambered. $275 plus shipping. Call 812-332-4519, 9 a.m. - 6 p.m. EST.

FOR SALE: Approx. 60 Rifle and 60 Handloader magazines, 1982-1990. Some duplicates. Like new. Most $2.00, some more, plus postage. Call or drop a line, state your wants, and I will set aside. Bill Johnston, Box 2250, RR 1, Freedom, Maine 04941, (207) 342-5559.

FOR SALE: Lyman 20X Super Targetspot. Fine crosshairs, includes extra set of front and rear ring mounts with click adjustments. $175.00. Bill Johnston, Box 2250, RR 1, Freedom, Maine 04941, (207) 342-5559.

Early Shilen action, SN 63 and early Shilen barreled action SN 26. Also Benchmaster Unrestricted rifle in 222 cal with rest. Winchester Highwall action and Stock, Clerke Highwall action, Wichita action. Various Hart and Douglas barrels, new in 7mm x 14 twist. John Pollock 913-883-4336.

Heavy varmint 6 PPC, .262 N.D. Hall B, right bolt/left port, Chanlynn barrel, Shilen 2 oz. trigger, Kelbly rings, Davidson bases bedded & lapped, McMillan graphite stock painted metallic silver. Smithed & stocked by Jim Greenawalt. 184 rounds. Magnificent shooter & looker. With or w/o 36x Leupold (choice of dot or reticle). Also matching Hunter Varmint (made at the same time with the same reamer, uses same cases, same color) on 700 Rem, Chanlynn barrel, by Greenawalt. Less than 100 rounds. With or w/o Leupold 6x. Also have complete loading rig (dies, tools, cases, the works) including many formed plus 50 new 220 Russian cases. All available separately or together, but I'll give you a great deal if you take it all! Jim Barker (802) 425-2212.

Barr & Stroud Rangefinder, good condition. 717-626-2948.

Remington 700 left hand hunter rifle 308 x 1 3/4 .332 NK., Hart barrel fired 850 rounds, Shilen trigger, McMillan stock with pad, Imron paint, $795.00. Dies available. Remington 700 left hand .223 match shoots factory ammo. Hart #5 contour barrel fired less than 100 rounds, Sako extractor, $595.00. Remington 700 left hand bare bolt, bushing with Sako extractor .222, $100.00. Mike (616) 538-2760 days 10-3 or anytime weekends, Michigan.

Jarrett custom .243 Ackley, Hart stainless steel barrel, Vaper Blast, 1-10 twist, 2430 bore, 650 Mussel, crown at 22". McMillan fiberglass stock Dark camo, classic Remington BDL, Shilen custom trigger, pillar bedded. Cruz. 1-805-252-6631.

WANTED: Marksman stock for Winchester pre-64 target rifle. F. Ficocello, 121-B Sylvan St., Danvers, MA 01923.

WANTED: Sinclair powder measure. Must be functionally perfect. (405) 759-2488.

FOR SALE: Hasecuster Rail Machine Rest. No action. No barrel. Used in 4 matches. $1,200. Tom Foster (303) 690-5061.

.22 P.P.C. Wichita 1375, 28" S.S. barrel, right bolt, left port, McMillan stock, pillar-glued, Remington trigger, 100 rds. Sako brass new, 31 rds. .220 Russian used. $925. John 402-733-8224 evenings.

FOR SALE: Rem 40XBR 22 BR Original. Remington Rifle, Rem 2 oz. trigger, Rings, Bases, 150 Brass $675 Excellent Conditon. Rem 40X 22 PPC, Shilen Barrel, 2 oz. trigger, Rings, Bases, Excellent Conditon $675.00. Fri., Sat., & Sun. (216) 627-2651.

Model 70 Winchester 30-06 post '64 Repeater Target Rifle. Matte black, complete with forend stop, sling, Redfield International sights and inserts. Low rounds. Excellent condition, accurate. $850 or will trade toward BR rifle with Hall or Stolle action. Dick (612) 571-9668.

Smith & Wesson M41 22 cal target pistol. 7" barrel, "A" serial number. Like new, with box, under 100 rounds. $450 or trade toward new Hall or Stolle PPC action. Dick (612) 571-9668.

FOR SALE: Sinclair neck turner used once, RCBS automatic priming tool, RCBS hand held priming tool new. RCBS case trimmer with 22 pilot and Collet. RCBS Auto Primer feed. RCBS Kinetic bullet puller new. RCBS primer seating depth gauge. Chrony chronograph brand new in box $50.00. RCBS Uniflow powder measure used very little $35.00. Redfield 6x18 Golden five star 4 plex still in the box $150.00. Redfield TR base and rings $15.00. After 4. Tim 319-547-3174.

WANTED: Leupold-Premier scopes, 700 short bolt, Hall or Stolle rifle or action for L.V. class. Roger 406-248-5223 evenings.

FOR SALE: 3 die set, steel, .30 cal., Simonson bulletmaking dies. 8s and 7s points, flat base. Insert for boat tails also. $1500. Ralph Council (713) 351-2349.

Approximately 1200 ronds of Lake City National Match 7.62 $10/box. Will talk trade on scopes, rifles, etc. Neilson neck turner with.22 mandrel. Like new. Cost $150, sell $125. 12 X 27 X 1 T-6 aluminum plates $110 ea. incl. shipping. 6 X 24 X 1 T-6 aluminum plates $60 ea. incl. shipping. Call Mickey Coleman (205) 382-6673 day, (205) 382-3418 night.

Dewey neck turning took, $40. Redfield match rear sight and mount for 40XR, $100.00. John Gammuto, (708) 963-3063 eves.

6PPC Hart - action, barrels, trigger. Right bolt and port, McMillan stock in candyapple red. 36X Leupold, with dot, silver, as new. Smithed by C. Hammond. Cases and dies go with gun. Will trade for Hunter Class gun or Live Varmint gun. Asking $1300. Bill 919-996-1255 (days) / 919-288-7025 (nights).

36X Leupold, like new, $400. 40X Premier, good condition, $425. Both with crosshair. Marlin 814-342-0320.

COMMENTS ON BARREL BREAK-IN AND ACCURACY

Continued

Well, back to the subject that I was (trying to) talk about, bore conditioning. Nick Wynne mentioned smoothing his gun club's rifle barrels with **LBT** lap compound to help minimize bore fouling. Don't do it if the bore is already a loose fit to jacketed bullets. Tight and rough is better for jacketed bullets than smooth and loose. We can fit cast bullets to any diameter, so if the barrel's bore is not smooth or straight, go ahead and lap, and results with properly fitted lead bullets will improve.

Regarding Friction Block, and lubricating with it to improve barrel breakin for jacketed bullets, and the discussion surrounding its merits... the manufacturer's statements notwithstanding, I learned many years ago, in metallurgy class, that steel does not have pores. Hence a lubricant cannot fill pores in a rifle bore. (Cast iron, used in engine blocks and most precision machinery's bearing ways does indeed have pores, which fill with, and retain oil, which is one reason that iron makes good engines). The bore finish of steel rifle barrels **does** have imperfections or indentations, created by the machining process of whatever method, and these imperfections are misnamed "pores". Of course lubricant fills them, and in the case of Friction Block, which the maker claims will last for 1000 shots before re-treating is needed, fills those holes, and stays. It doesn't move along from hole to hole by capillary action, lubricating the high spots, which are the true bearings in any sliding bearing surface. In the machine world, a bearing failure is caused when the lubrication film breaks down, and metals "gall", or tear each other; but we shooters call it jacket fouling. In an engine, super lubes which work by "filling pores" prevent wear of uneven high spots which must wear off before a tight enough seal is formed between piston rings and cylinder to wipe oil clean enough to prevent oil burning. Therefore mechanic's warnings not to use filler type lubricants in engines has no application for shooters.

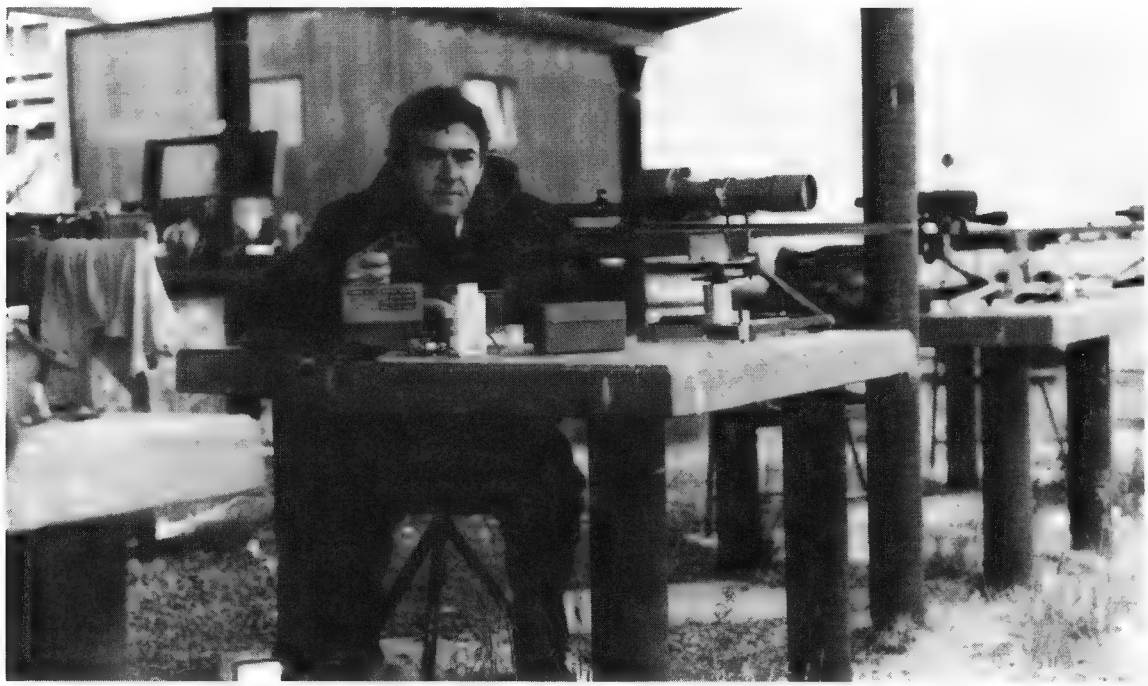
I know, from measuring thousands of them, that rifle bores, in most cases, are already larger than commercial jacketed bullets, so we want absolute minimum wear. With my brief experience with the product, Friction Block (or similar product) is the solution for breaking in barrels... for jacketed bullets.

In closing, I'll give this machinist's view of the mechanics of jacket fouling. Think of the barrel as a grinding wheel, with grit size relative to bore finish. As the bullets zip along its surface, jacket metal is melted from friction, or torn (abraded) from the bullet. If that jacket metal (in the barrel) is allowed to accumulate, each successive bullet has more jacket metal (which is less "slick" than steel) to scrub on, and more is peeled loose, and wadded into grooves in the bore finish. (In the machine world, only dissimilar, non porous metals are used as bearings, to avoid galling "fouling"). the shoot-and-clean barrel breakin procedure is mandated if one shoots only a dry bore, to allow bullets to rub the barrel's high spots, and wear it in. The final result is higher barrel cost, and possibly poorer bullet performance on game or target, because friction heat weakens bullet jackets dramatically, as well as loosens jackets from their cores, creating a rattle that we don't want, because the coefficient of expansion for copper alloys is so much greater than lead, and because the time span from barrel to target is not long enough for heat to transfer from jacket surface to the core. The higher velocity 22s can blow up bullets part way to the target for this reason. If it were caused only by a weak jacket, bullets would rupture as soon as they exit the muzzle, but instead they rupture at the point downrange where intense surface heat has time to penetrate and weaken the entire jacket.

A case in point. I have a very rough .243, with rifling almost gone about six inches up from the throat, due to a mud wasp's nest which unfortunately was not discovered in time. Conventional jacketed bullets become **MORE** explosive as ranges increase, out to at least 400 yards, rather than penetrate and hold together better at long range/lower impact velocity. Since accuracy is still plenty accurate for hunting, and most conventional bullets at best are poor performers, I use Nosler partition bullets exclusively in this rifle, which solves the problem nicely, without my having to rebarrel this particular rifle.

Veral Smith
LBT
HCR 62, Box 145
Moyie Springs, Idaho 83845

LEFT THE RANGE



AL MIRDOCH, of Calgary, Canada, passed away on December 4th, at the age of 56 years. We never knew Al personally, although we spoke to him several times by phone over the years. Reading his obituaries, he must have been quite a guy... certainly there were a number of people all worked up over his passing. It certainly seems as if there are a number of people, and a few animals, that feel that the world is going to be a lesser place without Al Mirdoch. Al never made it to the bigger matches, such as the Super Shoot, somehow business always had something popping up to prevent that trip. But in local and regional matches the fellow was the one that you had to beat. In 1991 Al attended 14 matches, of which 8 were hunter class matches; he won all 8 of them, plus the Western Hunter Nationals. He was the Shooter of the Year in both 1990 and 1991.

Even allowing for this fact that yours truly is a sentimental, emotional Irishman, the Sermon Notes for his funeral were greatly touching and moving. I thought we would share those notes with you, so that perhaps those of us who were not fortunate enough to know Al Mirdoch in life might realize, just a bit, that you missed knowing a nice person.

****** ****** ****** ******

AL MIRDOCH, was born October 18th, 1935 at Settler, Alberta to Nella Marie Zuehlke and Ross John Mirdoch. As a child, Allen, along with his sister Loretta, grew up in Prince George, B.C. and as a young man he moved to Banff, Alberta where he married.

After he married, the family settled in Central Alberta where his three daughters, Lori, Julie and Danelle were born. The grocery business took the family to Calgary in 1967 where the family has remained.

Al was a loving and supportive father and father-in law, who was always very encouraging in the pursuits and careers of his family. He was a most proud "grampa" to Holly, so much so that when he was in the hospital at the same time Holly was born, was found by the nurses pounding on the delivery room door looking for his grandchild.

Throughout his life he always treasured his pets, most recently his three cats, Sam, Blue and Blackie. His girls often joked with him that he spoiled the cats more than he did his kids.

Al grew up with a love of shooting which he eventually turned into a successful business, Alberta Precision Shooters Supply. His kids grew up on the rifle range, many of the family holidays being spent at Riflemen's Rodeos. He taught his girls to shoot at a young age and under his guidance they all became proficient marksmen. Al spent many years teaching shooting and rifle safety to young people at local gun clubs and was always willing to lend his expertise to fellow riflemen.

In 1971 he was a founding member of the Namaka Benchrest Shooters Club and spent much of his time promoting the sport of benchrest shooting. Al spent most Sundays at the range practicing and he became a very successful shooter holding many National and International records. He was quite proud that he has just won a National Championship. When not at the range, he spent a lot of time fishing with his friends in Montana.

Al had many friends and business associates, most of whom he met through his shooting. Most friends best remember "Big Al" for his jokes of questionable taste. His favorites were blond jokes and most were convinced this was why two of his daughters changed their hair color.

He will be sadly missed by his family, many friends and business associates.

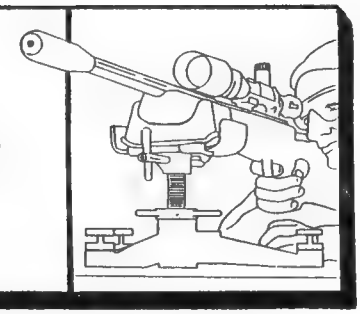
****** ****** ****** ******

(Photo and text courtesy of Gene Harne, of Cut Bank, Montana).

BR-50 International©

LARRY BROWN/Competition Coordinator
405 W. Washington #260
San Diego, CA. 92103
619*299-4455

CENTERFIRE.....100 yards
RIMFIRE.....50 yards
AIR RIFLE.....25 yards



MIDLAND SHOOTERS ASSOCIATION - Midland, TX. (RIMFIRE) 3/15/92

TOP-10 (Brad Calhoun 915/684-3764)

	NAME	AGGREGATE	RIFLE	SCOPE	AMMO	POINTS /UPDATE
1.	BRAD CALHOUN	3431.9700	Rem 40X	30 Lyman	Eley Tenex	10/ 10
2.	CHARLES HUCKEBA	2634.1875	Rem 40X	30 Lyman	Eley Tenex	9/ 9
3.	BILL MERRELL	2238.8800	H&R 5200	24 Simmons	Lapua Master	8/ 8
4.	CECIL TUCKER	2012.9300	Rem 37	24 Leupold	Eley Tenex	7/ 7
5.	KENNY TALIAFERRO	1634.2600	Rem 37	24 Leupold	Eley Tenex	6/ 6
6.	FRANK NELSON	805.8050	Am Eagle	(?)Simmons	CCI (?)	5/ 5
7.	RICHARD FOSTER	99.7025	BRNO	35 Lyman	CCI (?)	4/ 4

First official BR-50 match. We all had fun in 20+ mph crosswinds, but we're discovering the need for better equipment for this game. --Brad

JAMES CORCORAN WINS TWO-IN-A-ROW AT BORDEN!
(Custom Rem 37/24 Leupold/Fiocchi Exacta ammo)

WOOD TOWNSHIP CONSERVATION CLUB - Borden, IN. (RIMFIRE) 4/ 4/92

TOP-10 (Frank Martin 812/723-3189)

	NAME	AGGREGATE	RIFLE	SCOPE	AMMO	POINTS /UPDATE
1.	JIM CORCORAN	3749.4975	Rem 37	24 Leupold	Fiocchi Exacta	10/ 20
2.	EARL BALMER	3695.7375	Ans 54	20 Leupold	Fiocchi Exacta	9/ 9
3.	CLIF MUELLER	3462.8200	Rem 40X	36 Leupold	RWS R50	8/ 13
4.	ED LEDBETTER	3426.8281	Win 52	36 Leupold	Eley Tenex	7/ 7
5.	FRANK MARTIN	3365.0719	Win 52	24 Leupold	Eley Tenex	6/ 24
6.	GARRY GREINER	3235.7813	Ans 54	36 Unertl	Fiocchi Exacta	5/ 9
7.	JOHN GORDON	3210.2125	Ans 54	24 Leupold	Fiocchi Exacta	4/ 4
8.	BILL CALFEE	3124.9125	XP100 **	10 Weaver	Eley Tenex	3/ 16
9.	JIM HANKINS	3124.3438	Ans 54	36 Leupold	Fiocchi Exacta	2/ 17
10.	BRENDA GREINER	2946.8406	Ans 54	27 Unertl	Eley Tenex	1/ 14

Great match! Shooters came from MO, IL, IN, OH, & KY to compete in wind, rain, clouds, wind, sunlight, and wind. At times no flags would agree. (Did I mention wind?) --Frank (**GADS, CALFEE SHOT A PISTOL! --LB)

TOP 40 - USA RANKINGS 4/10/92

(of 91 ranked competitors)

	NAME (RIMFIRE)	G-LINE
1.	LARRY DELONG	183.45
2.	WARREN MCFARLAND	178.32
3.	SELBY WRIGHT	174.00
4.	JIM CORCORAN	165.04
5.	JIM BELL	164.77
6.	RON BOORD	158.10
7.	FRANK MARTIN	157.67
8.	JIM HANKINS	155.65
9.	HANK VANDENBOUT	152.83
10.	STAN HILL	148.20
11.	BILL CALFEE	147.35
12.	BRENDA GREINER	146.80
13.	EARL BALMER	144.95
14.	LEE MCFARLAND	142.60
15.	MACKY LOCKLIN	141.39
16.	GEORGE VARTANIAN	135.02
17.	ED LEDBETTER	130.25
18.	BOB POLANSKY	129.60
19.	CLIF MUELLER	129.25
20.	BRAD CALHOUN	126.88
21.	GARRY GREINER	126.64
22.	DAVID KIMES	123.77
23.	LOU MURDICA	123.45
24.	BOB MARTIN	121.42
25.	COLLIER HARRIS	118.94
26.	JIM MACK	118.21
27.	JIM TAYLOR	118.17
28.	DICK TRIPP	117.24
29.	DON STRASHEIM	117.04
30.	FRANK CLEARY	115.86

(AIRGUN)

1.	LARRY BROWN	166.15
2.	CHARLINE PRAY	159.96
3.	JIM FIERST	133.13
4.	TJ BROWN	131.60
5.	LEE MARKEE	128.37
6.	HOWARD PRAY	123.51
7.	DAVE MARKEE	122.43
8.	DAVE SCHNEIDER	121.57
9.	DARRELL MOTE	120.89
10.	CHRIS DOLAN	120.10

IBS News

Edited by Dave Brennan

GENESEE

On April 25, 14 shooters participated in Genesee Conservation League's first shoot of '92. Conditions were almost ideal, with light winds and cool (ok **cold**) temperatures, as evidenced by the 8 perfect 50-5 targets. Three of those targets were shot by George Hogan. Mr. Hogan came in from Bucksport Me. to accomplish this. George's wife Dawn also shot a perfect 50-5, which is darn good shooting especially for a new shooter. Also firing 50-5's were: Bob Bayley, Wendell Coye, and Harry Beaver. Harry wasn't sure he had really shot a 50-5 so just to be sure he did it again.

The results of our first 100 yard match were: 1st George Hogan 250-18, 2nd Wendell Coye 250-13, 3rd Jerry Klick 250-11. Matchwinner's equipment was: 40X action, Hart barrel, 6PPC with 28gr of H322 behind 68gr Euber bullets. The gun was put together by Seely Masker. Because everyone had so much fun, we shot another 100 yard match: 1st Wendell Coye 250-19, 2nd Harry Beaver 250-18, 3rd George Hogan 250-18. Match winner's equipment was 6PPC Stolle action, Hart barrel, 27gr of H322 behind Wendell's own Concave 68gr bullets, the gunsmiths were Kempher and Kelby. Our hybrid grand agg winners were: 1st George Hogan 500-36, 2nd Wendell Coye 500-32, 3rd Jerry Klick 500-24. Agg winner's equipment was same as the first 100 yards.

Other notes. There were 3 bench pistols on the line, one of which I was firing. This was my first match, firing a Bench Pistol, and I had a ball, came in last one of the shoots but really had fun. The match was actually the third time I had shot the gun, on paper, and was still trying to figure out how to hold it (one thing you do not want to do is double with someone, a good flinch will yield a 9. Two of my 9's were doubles). Second match I shot a 249-6 not great for the day but I did beat 3 rifles! The cartridge was a 22 BRat. That stands for BR altered and was designed by the gunsmith who put the rig together for me, Jim Stekl. He was also shooting a Bench Pistol in 22 BRat and came in 7th overall. John Stekl firing the third Bench Pistol, came in 8th overall. Nice consistency for Handrifles.

Reported by John C. Wagner

SALISBURY

We just finished writing up the Dunham's Bay match report for April 5th, and it was windy as all get-out there on that day. Now we move on to the Salisbury match report for that day, and it was very windy there also.

Salisbury hosted a 200 yard varmint for score match on April 5th. TED PARRECO, with a 244-5x, managed to stay one point ahead of Rod Morton's 243-0x (we would have to think it difficult to shoot a 243 score, and not hit that x-dot at least once; nonetheless, Rod carried off the trick). Balance of the top five for the day: 3.) Joe Davis 240-2x, 4.) Joe Dempsey 239-4x, 5.) Marshall Lewis 233-2x.

DUNHAM'S BAY

Things were tough at The Bay on April 5th. That old wind was whipping around down right briskly. There might be those who would dispute the "tough conditions" opinion, pointing to Paul Dion's .083 Official Screamer group in the second match; while voicing the opinion that Official Screamer groups are not fired in tough conditions. What can we say in rebuttal, except to point out (with all due apologies to the good Mr. Dion) that Paul sandwiched that nice, tidy little group between a .535 group and a .947 group.

ART COCCHIA outshot the 31 other shooters on this day for a clear-cut win. Ordinarily a .3184 aggregate at The Bay won't get you into the Top Twenty of a thirty shooter match. Today it won the top prize by a convincing margin. Top ten shooters for the day were: 1.) Art Cocchia .3184, 2.) Tom Lake .3408, 3.) Bill Niemi .3648, 4.) Myles Hollister .3662, 5.) Norm Dixon .3920, 6.) Vince Giaimo .3968, 7.) Mike Sicina .4088, 8.) Al Gustafson .4158, 9.) Frank Harris .4212, 10.) Tom Svack .4242. We note, with complete detachment, that 31 out of the 32 shooters fired 6 millimeter for the occasion.

BILL NIEMI was the winner over 9 other shooters in the hunter class, firing his .30 Viper wildcat. Top 5 shooters in this class were: 1.) Bill Niemi 249-10x, 2.) Bob Lembo 248-12x, 3.) Jim Lyon 247-6x, 4.) Jerry Gaulin 245-10x, 5.) Brian Niemi 244-8x. The top 8 shooters, in this 10 shooter field, shot .30 caliber today. Must have been of some help in that wind!

UNION COUNTY

April 12th at the Union County range, and JEANNE LYNN got out in front of 22 other shooters in the varmint for score class, and stayed there for the class win. Top shooters for the class were: 1.) Jeanne Lynn 250-13x, 2.) Larry Hanselman 250-12x, 3.) Bill Gebhardt 250-12x.

VINCE PASTORELLA's .308 managed to stay ahead of Frank McKee's Aardvark in the hunter class. Top three shooters: 1.) Vince Pastorella 249-12x, 2.) Frank McKee 248-14x, 3.) Gary Long 248-11x.

AL WEAVER put up a 250-9x to beat out the other 5 shooters in the varmint-hunter class.Top three shooters: 1.) Al Weaver 250-9x, 2.) Kenneth Livengood 249-8x, 3.) Dwight Furrow 244-6x.

SULPHYR SPRINGS

This is the April 26th score match at the Muncy, Pa. range.

CORY FRASK used the Creedmore rule to beat out Bill Gebhardt in the 14 shooter light varmint for score class. Top guns were: 1.) Cory Frask 250-19x, 2.) Bill Gebhardt 250-19x, 3.) John Stahl 250-15x, 4.) J.F. Borden 250-15x, 5.) Harold Hill 250-12x.

PAUL RYAN was another user of the Creedmore rule, in the 18 shooter heavy varmint for score class. 1.) Paul Ryan 250-16x, 2.) Carl Lynn 250-16x, 3.) Dennis Collins 250-15x, 4.) Robert Waechter 250-14x, 5.) Cindy Waechter 250-12x.

KEN LIVENGOOD won the 7 shooter varmint hunter class, with a 250-16x. He was followed by Al Weaver's 249-14x, and Bill Creasy's 248-7x.

AL WEAVER won the 10 shooter hunter class with a 249-14x. Randy Fritz took second spot with his 249-12x, and Frank McKee was third, via a 249-11x figure.

1992 TENTATIVE MATCH SCHEDULE SCORE

June 6-7 — DUNHAM'S BAY, N.Y.S. Score Championship, 9 a.m., H/VH/VFS, 6/6 100 yards, 6/7 200 yards

June 7 — SALISBURY, 100 yards, 11 a.m., H/VH/VFS

June 14 — CAPITAL CITY, 100 yards, 9 a.m., H/VH/VFS

June 14 — PALMISANO, 100 yards, 11 a.m., H/VH/L&HV

June 21 — YORK, 100 yards, 11 a.m., H/VH/VFS, York County Championship

June 21 — GUTHSVILLE, 100 yards, 10 a.m., H/VH/VFS

June 28 — THURMONT, 100 yards, 11 a.m., H/VH/VFS

June 28 — CAPITAL CITY,100 yards, 9 a.m., H/VH/VFS

June 28 — SULPHYR SPRINGS, 100 yards, 10 a.m., H/VH/LV/HV (FC)

July 5 — ORRINGTON, 100 yards, 9 a.m., H/VH/VFS

July 5 — BOWMANSTOWN, 100 yards, 10 a.m., H/VH/VFS

July 11-12 — MAINVILLE, Pa. State Champ, 100 yards 10 a.m., H/VH/VFS, 200 yards 9 a.m., Rotation - Classes Mixed in Relays

July 19 — GUTHSVILLE, 100 yards, 10 a.m., H/VH/VFS

July 19 — SALISBURY, 100 yards, 11 a.m., H/VH/VFS

July 19 — YORK, 100 yards, 11 a.m., H/VH/VFS

July 25-26 — CAPITAL CITY, Maine State Championship, 7/25 - 100 yards, 9 a.m., 7/26 - 200 yards, 9 a.m. H/VH/LV/HV (FC)

July 26 — THURMONT, 300 yards, 11 a.m., H/VH/VFS

July 26 — SULPHYR SPRINGS, 100 yards, 10 a.m., H/VH/LV/HV (FC)

August 2 — SALISBURY, 200 yards, 11 a.m. H/VH/VFS

July 2 — PALMISANO, 100 yards, 11 a.m., H/VH/L&HV

August 8-9 — UNION COUNTY, Pa. State Championship 200/300 yards, H/VH/VFS, 9 a.m. each day

August 16 — CAPITAL CITY, 100 yards, 9 a.m., H/VH/VFS

August 16 — YORK, 200 yards, 11 a.m., H/VH/VFS

August 23 — THURMONT, 200 yards, 11 a.m., H/VH/VFS

August 23 — BOWMANSTOWN, 100 yards, 10 a.m., H/VH/VFS

August 30 — CAPITAL CITY, 100 yards, 9 a.m., VFS

August 30 — PALMISANO, 100 yards, 10 a.m., H/VH/VFS

September 6 — SALISBURY, 200 yards, 11 a.m., H/VH/VFS

September 6 — LEETOWN, 100 yards, 10 a.m., H/VH/VFS

September 6 — BOWMANSTOWN, 100 yards, 10 a.m., H/VH/VFS

September 13 — SULPHYR SPRINGS, 100 yards, 10 a.m., H/VH/LV/HV (FC)

September 13 — ORRINGTON, 100 yards, 9 a.m., H/VH/VFS

September 19-20 — UNION COUNTY, IBS SCORE CHAMP, 9 a.m., H/VH/VFS, 100/200 yards

September 27 — MAINVILLE, 100 yards, 10 a.m., H/VH/VFS

1992 TENTATIVE MATCH SCHEDULE GROUP

June 6-7 — DUNHAM'S BAY, 100/200 yards, 9 a.m., H/L&HB

June 13-14 — UNION COUNTY, IBS 200/300 CHAMPIONSHIP (incl HB) Sat 9 a.m. LV - Sun. 8 a.m. HV

July 4-5 — SOUTH CREEK, 100/200 yards, 8 a.m., HV/LV

July 18-19 — CAMILLUS, 100 Sat., 200 Sun., 9 a.m. both days, HV/AM LV/HB PM (C Hart Mem 10 sht 200 LV or HV after HV Sun)

July 25-26 — DUNHAM'S BAY, 100/200 yards, 9 a.m., H/L&HB, Strange Duck Invitational.

August 1-2 — PAINTED POST, N.Y.S. METER CHAMP, 9 a.m. both days, LV/HB AM HV PM 100 Sat 200 Sun

August 17-22 — FAIRCHANCE, IBS NATIONALS

August 30 — UNION COUNTY, 100 yards L/H 22 Rim Factory 9 a.m.

August 30 — CAPITAL CITY, 100 yards, 9 a.m., HV

September 27 — DUNHAM'S BAY, 11 a.m., Memorial Shoot HV-100 Meters H 100 yards

October 3 — SALISBURY, Maryland St Championship - H/VH/VFS, 100 yards, 10 a.m. -200 yards, 9 a.m.

October 3-4 — UNION COUNTY — 100 yards, 10 a.m., H/VH/VFS 22 RIM FC

October 11 — SULPHYR SPRINGS, 100 yards, 10 a.m., H/VH/LV/HV (FC)

October 18 — YORK, 100 yards, 11 a.m., H/VH/VFS

October 18 — PALMISANO, 100 yards, 10 a.m., L/VH

October 25 — MAINVILLE, 100 yards, 10 a.m., H/VH/VFS

November 1 — SALISBURY, 100 yards, 11 a.m., H/VH/VFS

November 8 — MAINVILLE, 100 yards, 10 a.m., H/VH/VFS

November 15 — THURMONT, 100 yards, 11 a.m., H/VH/VFS

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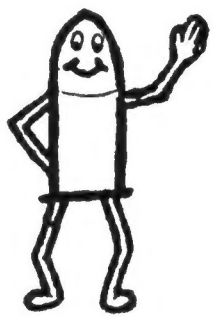
The 92 score season has opened with a bang (pardon the pun just had to say that). Leetown had a good turn out on 3/29. The BB award of the month has to go to the Salisbury club, who on 4/5/92 started the season with a 200 yd match. The first place finisher shot a 244-5x while the last place finisher shot a 173-2x in varmint for score. Looks like the winter blahs are still around.

When looking over the match reports one can usually figure on several gimmees on the equipment list, such as, .30 cal in hunter class and 6PPC in varmint for score. Well guess what, the world is not as predictable as one would think. Up in Dunham's Bay we have two fellows, Rocky Murray and Tom Lazot, shooting 6's in Hunter and in York we have Don Jones shooting a 25TP, Calvin Willard Jr. a Short .30, Paul Bielec a 6SBR, Ken Markle a 7K&M and 2 gentlemen shooting 6BR's in Varmint for Score. Looks like the equipment list may be interesting reading this year. Experimenting in our sport may not be dead!!!!! Probably your first question is, "How well did they do?" Well, the 25-TP-250-17X's, Short .30-250-15X's, 6SBR-250-13X's, 6BR-247-12X's and the 7K&M-247-11X's not bad huh?

While talking to one of the Score committee members during the winter, I found out that score shooting matches were being held in Iceland. I couldn't let this go by without finding out how things happen in the frozen Atlantic. I sent a letter to Johannes Frank Johannesson (put that on an equipment card) asking several questions about shooting in Iceland. Back came a most interesting reply. Joe mentions the fact that the population of Iceland is approximately 250,000 and there may be a total of 25-30 benchresters. It seems the conditions in Iceland are a mixture between the wind at Mainville and the cold in Maine. One of their July matches was shot in +0 to +7 degrees C. They shoot only VFS and the best score has been a 250-19X's. The equipment is basically the same we use: Hart, Wiseman, Shilen, Sako, Remington, Hall, Wichita, McMillan, Brown, Six, etc., etc. The only difference in calibers is that they are shooting a 22-45 and a 223 along with the normal PPC series. According to Joe's letter, the biggest difference between us is the cost of the sport. In Iceland a pound of USA powder is around $46.00, bullets-6mm are $246.00 and 30 cal about $380.00, primers 205's and 7 1/2's $50.00 to $80.00 and a Leupold 36X $800.00. Sort of takes your breath away doesn't it? All in all though, it sounds if Joe and his fellow shooters really do enjoy the Score shooting game the way we do. Joe said he will send some more info on their equipment and matches as as the season develops.

MAY YOUR X COUNT BE HIGH,

B.B.



INTERNATIONAL BENCHREST SHOOTERS

IBS OFFICERS

PRESIDENT
Brian Hollister
RD 2 Box 60
Whitehall, NY 12887
Phone (518) 499-1569

VICE PRESIDENT and
MATCH SCHEDULE CHMN.
Edna White
8 New Jersey Ave.
Lake Hopatcong, NJ 07849
Phone (201) 663-5159

2nd VICE PRESIDENT
Paul Ryan
1005 Pheasant Run Rd.
Clarks Summitt, Pa. 18411
Phone (717) 587-4013

TREASURER
Brian Rubright
1008 S. Quince Rd.
Walnutport, Pa. 18088
Phone (215) 767-1339

SECRETARY
Gary Long
Box 20 Lake Road
Millville, Pa. 17846
Phone (717) 458-5444

RECORDING SECRETARY
Joan Borden
RR 1, Box 244A
Tunkhannock, Pa. 18657
Phone (717) 833-2234
FAX (717) 833-2382

PAST PRESIDENT
James F. Borden
RR 1, Box 244A
Tunkhannock, Pa. 18657
Phone: (717) 833-2234
FAX (717) 833-2382

IBS EDITOR
David D. Brennan
37 Burnham Street
East Hartford, Conn. 06108
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BENCHREST IN ICELAND

Wish we could give you this one in color. That's the Atlantic Ocean in the background, the lighter colored spots are ice!

Mannlichers are not really all that common at US benchrest matches!

The Iceland correspondent (Johannes Frank Johannesson).

STRANGE DUCK INVITATIONAL DATE CHANGE

There are a myriad of reasons why we have elected to change the date of the Strange Duck Invitational from the originally announced date of June 27-28 (PS Magazine, May 1992 issue, page 39).

But basically the final decision revolved around the fact that there is no match at Dunham's Bay on June 27-28 (in this month's match schedule it is changed to June 6th and 7th).

That strikes us as a good reason to change the date of the Strange Duck Invitational, still to be held at Dunham's Bay . . . to July 25 and 26.

If, at the time of your reading of this match change, any of you have already left for the June 27-28 match . . . gee, we're sorry!

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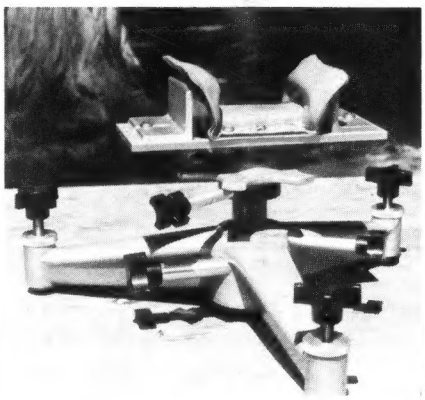

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INTERNATIONAL BENCHREST NATIONAL CHAMPIONSHIPS

AUGUST 17-22, 1992
FAIRCHANCE GUN CLUB

The 23rd Annual International Benchrest Shooters Championships will be held at the Fairchance Gun Club, Smithfield, Pennsylvania the week of August 17-22, 1992. You are invited and welcome to come and shoot with us.

Classes: Unlimited, five 10-shot matches, sporter, light varmint, and heavy varmint. Five 5-shot matches at each yardage in each class. Warm up matches August 17 & 18 and if time permits the 21st & 22nd.

Course of Fire:
August 17th 9 am 100 yard Unlimited
August 18th 9 am 200 yard Unlimited
August 19th 8 am 100 yard Sporter & Light Varmint
August 20th 8 am 200 yard Light Varmint & Sporter
August 21st 8 am 100 yard HV Vrmint Powder Puff
August 22nd 8 am 200 yard Heavy Varmint

Awards: IBS Travelers, Keeper plaques, Top 20 patches, Champion patches, and match pins in each class and multi-gun. The Two Gun Champion will be based on the Light Varmint and Heavy Varmint. The Three Gun will be the Two Gun plus Sporter. The Four Gun will be Three Gun plus Unlimited.

The Club will provide trophies through fifth place in Range Aggs and second through sixth place in Grand Aggs and Multi-Guns. First place Junior Trophy for each yardage and Grand in Heavy Varmint plus second place Grand in Heavy Varmint. Each competitor will receive a participation patch.

August 21 Merchandise Drawing and Spaghetti Dinner. Merchandise contributors will be listed in program if received in time for publication.

Pre-Registration **REQUIRED** — After July 17 a $10.00 late fee will be assessed.

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